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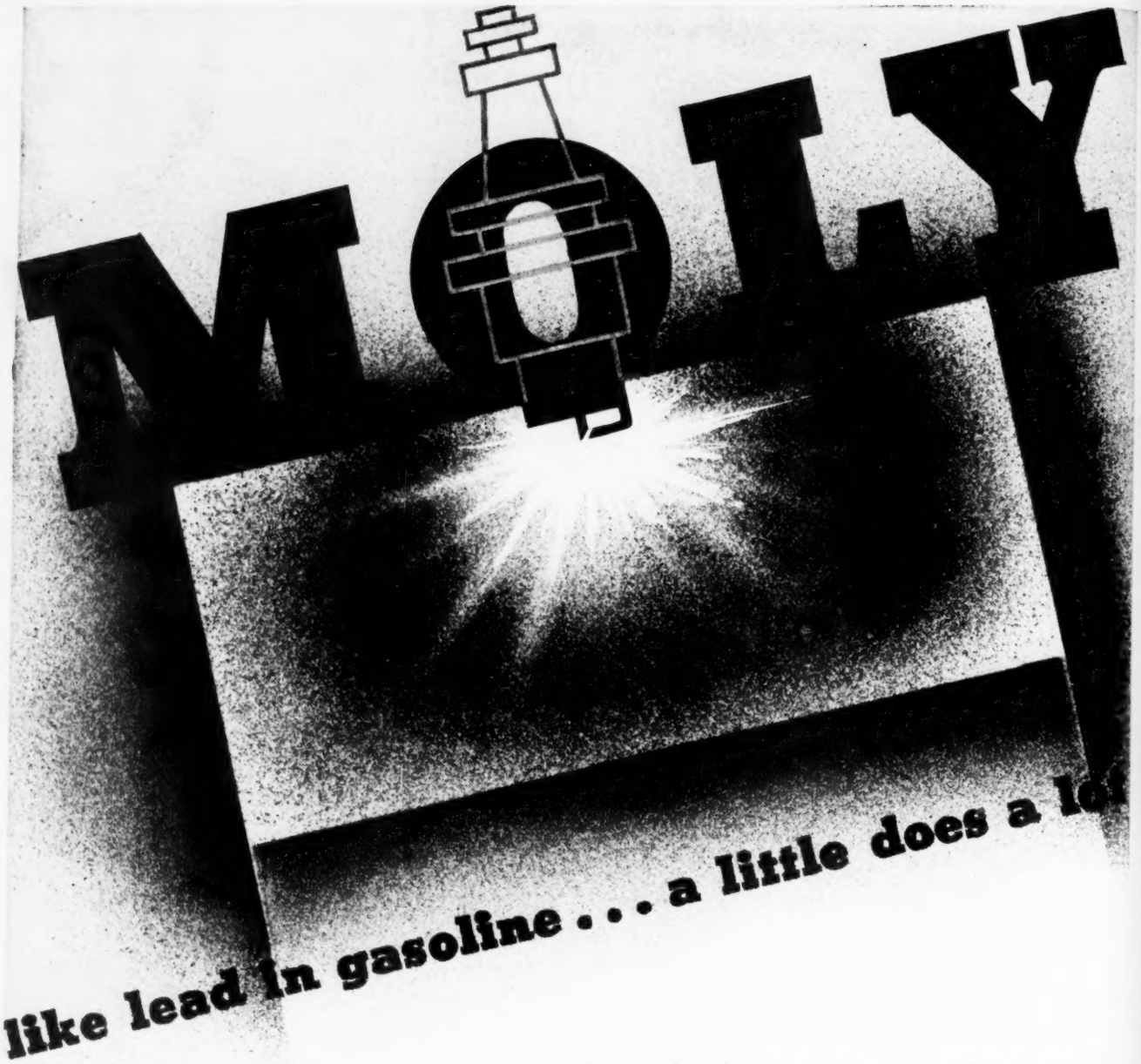

WHAT is probably the most remarkable of "Moly's" many qualities toward improving iron and steel becomes strikingly apparent in its use in copper-bearing ingot iron. *Less than one-tenth of one per cent* is known to allow the addition of twice as much effective copper in ferrous metals designed to resist atmospheric corrosion and that encountered in mildly acid or oil-refinery liquors.

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As the Editor Views the News

PRESIDENT ROOSEVELT'S talk to members of the advisory council of the national conference on economic security, while disconcerting to some of the "social minds," was mildly encouraging to industry. When, in speaking of old age pension plans, he said that "organizations promoting fantastic schemes have aroused hopes which cannot possibly be fulfilled," he voiced a fact strangely in contrast with some of his previous references to the subject. In calling attention to the difficulties in drafting workable plans for unemployment insurance, sickness benefits and pensions, he expressed a measure of caution which can be understood by every industrialist who has had experience with these devices.

• • •

Why Industry Is Wary

Perhaps it is unfortunate that the public does not appreciate industry's exact attitude toward job insurance. Industry usually is represented in the newspapers as being unalterably opposed to such legislation. A clearer statement of industry's attitude probably would be that it would prefer the principle of unemployment insurance to that of an outright dole or of wasteful relief, but is justifiably suspicious that any hastily drawn legislation will be open to abuse, and—because of the present emotional state of the public—undoubtedly will be intended to throw a disproportionately heavy burden upon payrolls. Experience in European countries fully warrants these suspicions.

• • •

A Good Time for Caution

Another reason why it is important that social legislation be approached warily is that we are not yet safely out of the present depression. At this moment the nation is about to enter upon another drive for recovery—the third since early in 1933. We lost most of the ground gained in the first two attempts (p. 26), largely because industry was so heavily burdened with the trappings of reform and relief. Would it not be well to go into this third drive without too many handicaps? In spite of the present state of the public mind in regard to social legislation, it is quite possible that with smart, intelligent leadership, American industry could present a strong case for deliberate, sensible action on job insurance and pensions before the bar of public opinion.

• • •

Statesmanship An Asset

In this and all other legislation likely to be considered in the next session of congress, compromise will be the order of the day. As in the last congress, the danger of the passage of extreme laws (p. 21) will be greatest in the closing days of the session. In fact, from now on until fairly normal conditions return, industry will need the highest type of statesmanship it can command. Employers in the steel industry now are experiencing a test of such statesmanship in their negotiations with professional union labor (p. 14) for an understanding that will do away with the present sniping. The need for tact and diplomacy also arises in relations between divisions of an industry, as witness the consideration of mill quantity extras for (p. 16) plates and shapes.

• • •

Steel for Houses

From widely separated points on the globe come illustrations of the contribution of steel to the comfort of living. Steel with cork insulation has been employed in the construction of two portable houses (p. 33) to meet the climatic extremes at Nome, Alaska. In Germany steel is being used in residence construction and in furniture and house fixtures (p. 36) to an extent suggesting that that nation is a leader in these applications of rolled steel. At home an eastern company has developed a cylindrical telephone booth (p. 43) of sheet steel . . . . At Pittsburgh members of the International Acetylene association discussed flame cutting, gas welding and kindred problems (p. 55) at its highly successful thirty-fifth annual convention . . . . The application of powder metallurgy to ferrous metals (p. 52) is gaining momentum.

E. L. Shaner

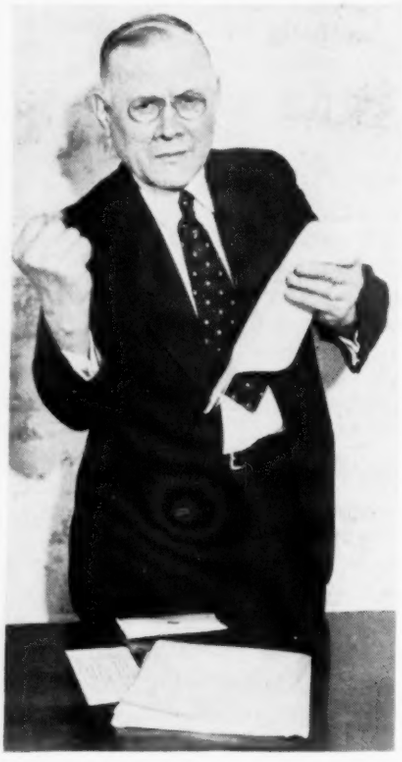
Obdurate Labor Delays Steel Truce Sought by President

AN INDUSTRIAL truce of the type proposed by the President in his fireside radio address Sept. 30 is under negotiation for the iron and steel industry.

The initiative, it is understood, has come from the White House and the objective is a public agreement by the industry to recognize outside labor organizations to the extent of their proved strength.

Two hitches appear to have arisen. One is the demand of organized labor that, where it can muster a majority, it speak for all employes. This would automatically exclude employe representation plans in these plants, and producers are in no mood to concede this.

The other hitch is a sort of jurisdictional dispute between William Green, president of the American Federation of Labor, and Michael F. Tighe, head of the Amalgamated Asociation of Iron, Steel and Tin Workers. Dissatisfied with the Amalgamated's slow progress in organizing the steel industry, the federation voted at its convention in San Francisco last month to undertake the task itself.



They battle for the right to deal with steel. After leading the Amalgamated for years, Michael F. Tighe (above) regards himself as the leader of steel labor. But William Green (below), head of the A. F. of L., wants the job

NSLRB Directs Action

The negotiations have been under the aegis of the national steel labor relations board. It was expected last week that almost daily a formal public statement could be issued, which would be a gesture toward recovery by insuring peace in the steel industry.

So far as the steel industry is concerned, the word "truce" is a misnomer. In the main, it has been willing to treat with the Amalgamated, but demanded proof of its strength in every instance. This was generally refused. Any hostile action has been on the part of the outside labor organization, seeking to crush employe plans.

This willingness to deal with the Amalgamated on the basis of proved strength was evidenced at Pittsburgh last week when the Pittsburgh Steel Co. agreed to an election at its plants in Monessen and Glassport, Pa., provided the Amalgamated could show that a majority of its workmen wanted such election.

This stand by Pittsburgh Steel is typical of the industry's position. It is unwilling to submit to an election when the demand arises not with employes but from outside agitators.

A somewhat similar position has been taken by the Weirton Steel Co., which has been in the federal court at Wilmington, Del., for a number of weeks in a case growing out of its election, last Dec. 15, of employe representatives. Amalgamated proof of strength has been lacking.

Indeed, it is this weakness which is causing a rupture between the A. F. of L. and the Amalgamated. At the Sept. 15 election, when the 76-year-old "Mike" Tighe was re-elected, only 6500 votes were cast, an increase of 1000 since 1932. In May, when iron and steel producers reported their employment at 97 per cent of the peak of 1929, the number of wage earners was 409,698.

Unwilling to let its golden opportunity under section 7a of the recovery act pass, the federation is understood to have selected Arthur O. Wharton, head of the machinists' union, to organize the steel industry.

Conferences were held in Washington late last week between Messrs. Green and Tighe, and on Friday Mr. Tighe was in session with Assistant Secretary of Labor McGrady.

The President apparently desires steel and organized labor to shake hands in public. There appears to be a presidential itch to "reform" the steel industry, as President Harding in 1921 took the initiative in getting steelmakers to adopt the 8-hour day.

Stumble Over Majority Rule

The proportional representation plan which the President himself introduced into the automobile industry last fall and which he extended recently to Feb. 1 would satisfy steel, in the main.

Inferentially, the steel labor relations board has decreed majority rule for the steel industry—a point which appears to be a sticker in the current negotiations. When the Amalgamated won the election at the West Virginia Rail Co., Huntington, W. Va., in September its order specified that the Amalgamated would represent the rail company's employes.

On demand of the Amalgamated, hearings have been held or adjustments consummated in cases involving the Acme Steel Co., Chicago; Republic Steel Corp.'s Warren and Niles works; Youngstown Sheet & Tube Co.'s Indiana Harbor plant; Wheeling Steel Corp.'s Portsmouth plant; Apollo Steel Co., Apollo, Pa.; Northern Steel Co., Somerville, Mass.; and the West Virginia Rail Co., as noted previously.

Striking testimony of the weakness of the Amalgamated was adduced last week at the Weirton trial in Wilmington. John Sanders, an employe of the Standard Tin Plate Co., Canonsburg, Pa., and an Amalgamated official testified that, although

normally more than 13,000 steel workers are employed by Weirton, the seven Amalgamated lodges in the vicinity of the Weirton plants had only 183 members eligible to vote at the Sept. 15 election. This testimony probably made it unnecessary for Mr. Tighe and Louis J. Leonard, secretary-treasurer of the Amalgamated, to testify at Wilmington.

Other Labor News

Oft postponed hearing on the alleged intimidation of Jones & Laughlin Steel Corp. employes at Aliquippa, Pa., took up a morning and afternoon session of the national steel labor relations board at Pittsburgh Friday. The Amalgamated introduced over two score mill employes before Judge Stacy, presiding, as Admiral Wiley and Dr. Mullenbach were absent.

Witnesses enumerated charges of shadowing by special police and their inability to hold meetings at Aliquippa. However, all witnesses admitted that the company's nonunion activities have quieted since October and the defense proved that many witnesses were undesirable citizens regardless of union activities.

BIDDLE HEADS LABOR BOARD

Francis Biddle, of the Philadelphia law firm of Barnes, Biddle & Myers, was appointed chairman of the national labor relations board Friday by the President, to succeed Lloyd K. Garrison, who returned recently to his post as dean of the law school of the University of Wisconsin.

ORE MINERS GET BONUS

Hemlock Iron Mining Co., an interest associated with Pickands, Mather & Co., Cleveland, has rewarded 100 "loyal and faithful employes" at the Warner mine, near Amasa, Mich., Menominee range, with a cash bonus of $30,000, individual payments ranging from $150 to $400. The Hemlock company has only one mine in Michigan, the Warner, and is closing that Dec. 1, withdrawing from the state.

SHEET WAGES STATIONARY

Sheet and tin plate mill wages under the Amalgamated Association of Iron, Steel and Tin Workers' scale will remain unchanged for November-December, 15 per cent above base, it was determined last week. Average sales price of 26, 27 and 27 gage black sheets in September-October was 2.65c, the same as in the preceding two months.

LIVING COST EASES DOWN

First decline since April in the cost of living of wage earners is noted for October by the National Industrial Conference board, New York. On the basis of 1923 equalling 100, the October index was 80.9, compared with 81 in September. Stated another way, purchasing value of the dollar was 123.6 cents in October, compared with 123.5 in September and 139.9 in April, 1933.

Financial

REPUBLIC STEEL CORP. last week crossed the 50 per cent mark in obtaining proxies of both common and preferred stock to be voted in favor of the absorption of the Corrigon, McKinney Steel Co., the collocation of the Truscon Steel Co., and reclassification of Republic's capital structure, according to T. M. Girdler, chairman of Republic.

Allegheny Steel Corp., Brackenridge, Pa., has declared a regular quarterly dividend of $1.75 on the preferred, payable Dec. 1 to record of Nov. 15. A dividend of 15 cents on the common, payable Dec. 15 to record of Dec. 1, has also been declared. A payment of 15 cents on the common was made on Aug. 15.

New Capacity

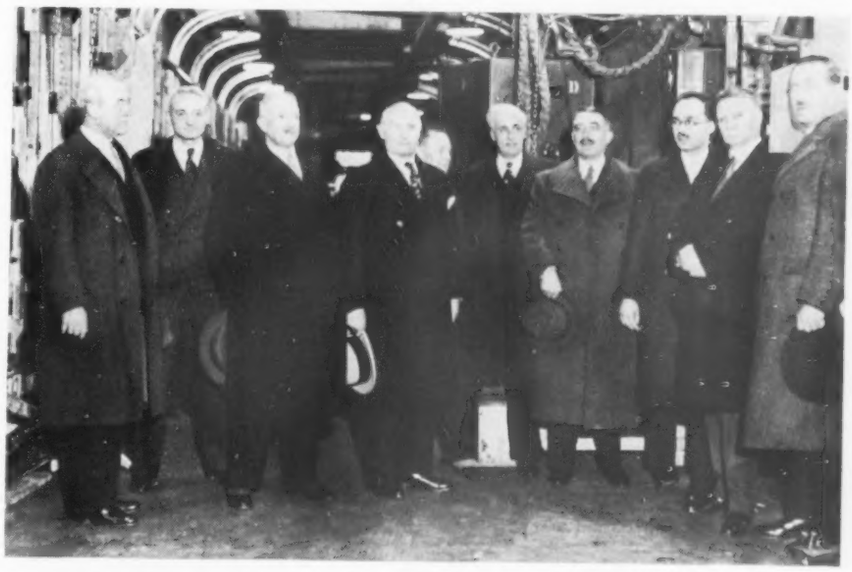
McCLOUTH STEEL CORP., Detroit, began turning over its new hot-strip mill, which is capable of making narrow sizes, early last week. The mill, which is built to Cold Metal Process Co. patents, began rolling strip flat, but it is expected reels will be utilized shortly.

MACKINTOSH SHOWS TATA MILL

Before it is shipped to the Tata Iron & Steel Co., India, within the next few weeks, Mackintosh-Hemphill Co., Pittsburgh, is holding an inspection for prominent steel mill equipment engineers, Nov. 19, at its Wooster, O., works, where the 3-high sheet mill built for the Tata company has been built and temporarily erected. Unusual speed performance is claimed for this rolling mill, which is equipped with Wean Engineering Co. tables, motors made by Reliance Electric Co., and controllers by Clark Controller Co.

Transportation

CONGRESS will be asked to sanction a reorganization of the interstate commerce commission to provide centralized supervision over all forms of transportation, Joseph B. Eastman, member of the commission and federal co-ordinator of railroads, intimated in an address before the National Traffic league in New York, Wednesday. This would put motor truck transportation under federal regulation and, presumably, develop into a program where railroad, truck and water transportation receive protection in their own fields.



FRANCE COMES TO BUDD: Latest developments in construction of lightweight high-speed railroad trains at the plant of the E. G. Budd Mfg. Co., Philadelphia, were viewed last week by a delegation of engineers representing French railroads. Especial interest was shown in the use of lightweight stainless steel in car construction and the shotweld process developed by Budd for fabricating the steel. Reading from left to right the photograph shows F. H. Russell, manager Hi-Tensile division, the Budd company; A. H. Ehle, sales manager rail car division, the Budd company; Emile Pellarin, assistant director, Chemin de Fer de L'Est; Louis Baticle, director of railroads under the minister of public works; Pierre Abbat, director and chief engineer, Worms & Company, French manufacturer of railway equipment; Filipo Schiaffino, Piaggio & Co., licensees of the Budd company in Italy; Charles Epinay, chief engineer, Chemin de Fer Paris, Orleans et Midi; Jean Walter, engineer, Chemin de Fer de L'Etat; Edward G. Budd, president, the Budd company, P. G. Van de Velde, manager of the Budd company's French office

Extras

BUTTRESSING its arguments in favor of mill extras on small quantities of steel plates and structural shapes, which the American Iron and Steel institute made effective Oct. 1 but suspended until Dec. 1, the American Steel Warehouse association, Cleveland, last week supplied interesting data on the mill and warehouse markets.

Steel mills in the United States number 232, in the first ten of which is concentrated about 85 per cent of ingotmaking capacity. Warehouses owned by steel mills total 75 and warehouse distributors represented by the association 175, making a total of 250 active steel warehouses. Including many companies engaged in such other business as fabricating, wholesale hardware, etc., the total number of steel and miscellaneous distributors is 800.

Reflecting in a general way the markets of the steel mills serviced by steel mill salesmen and including customers whose requirements are large enough to warrant direct contacts between the mills and customers, the steel mill market is set up as follows:

Large general manufacturers	8,000
Automotive, including accessories	500
Railroads	100
Public utilities	100
New construction	1,000
Jobbers	800
	10,500

The steel market reached by the warehouse distributor is claimed by the association to embrace 167,500 buyers, as follows:

New and small manufacturers	50,000
Upkeep and maintenance buyers —non-metal industries	40,000
Mines and quarries	10,000
Public utilities, including light, power, rails, gas, waterworks, cities, states, etc.	24,000
Power plants	23,000
Contractors and builders	10,000
Large steel consumers (Mill market list for small rush requirements)	10,500
	167,500

Arguments by the association in favor of mill extras on small lots of plates and shapes are: Mills should base their prices upon production, handling, and all other costs; below-cost selling by the mills amounts to unfair competition; the warehouse position has been imperiled by the withdrawal of preferential prices forbidden by the steel code; the middle man is necessary because he renders a distinct service; a discrimination in price because of quantity sold is not contrary to the antitrust laws; bar quantity extras have been accepted by the trade.

Average size of orders handled by steel warehouses has been declining, according to the association, from 1732 pounds in 1912, to 1728 in 1920, to 930 in 1925, to 724 in 1929, to 418 in 1932, with a slight rebound to 456 pounds in 1933.

Quantity extras sought on plates and shapes on mill shipments are 10 cents per 100 pounds on 5999 to 4000 pounds; 20 cents on 3999 to 2000 pounds; 50 cents on 1999 to 1000 pounds and $1 on 999 pounds and less.

Directors of the American Iron and Steel institute were believed to have considered the matter of quantity extras at a meeting Friday. Since mills open books for the first quarter Dec. 1, a decision is required. Fabricators of structural steel are opposing quantity extras on the ground the character of their business necessitates the ordering of small lots.

Additional news will be found this week on page 62.

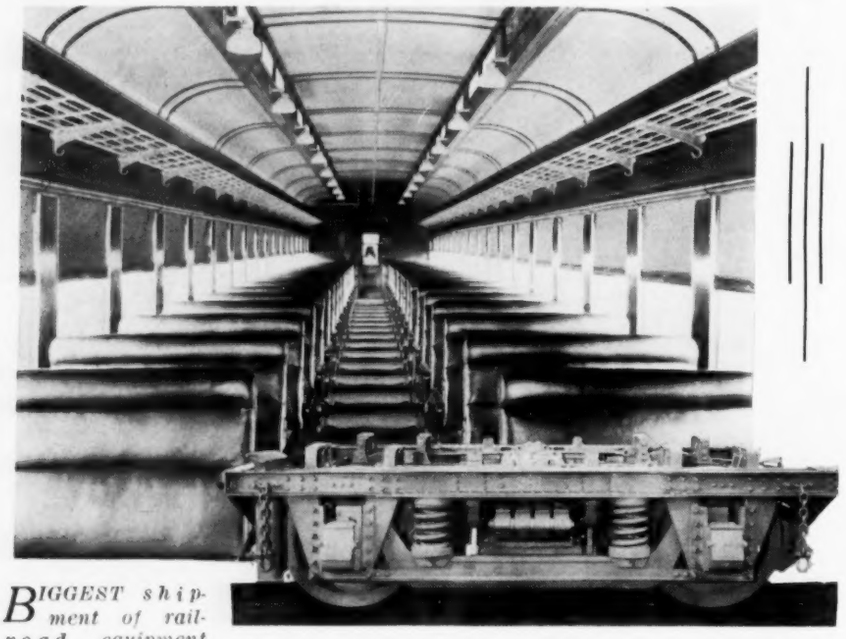
SPECIAL STEEL WAREHOUSE EXTRAS MERELY OUT OF BOOK

Published reports to the effect that warehouse extras on a number of special steel classifications have been eliminated by the American Iron and Steel institute are in error. The institute as such has nothing to do with such matters.

Recent action by the board of directors with respect to these extras simply involved the removal of them from the steel code extras book, this action being due to the fact that they are not mill extras and should not have been included.

So far as the warehouse trade is concerned, these extras still stand as before. The extras apply on high speed steel, high speed drill rods, tool steel, tool steel drill rods, automotive carbon dye steel, drill steel and nitralloy.

The extras for store service on shipment from warehouses are 2 cents per pound from points on or east of the Mississippi River and 3 cents west of the Mississippi.



BIGGEST shipment of railroad equipment since the beginning of the depression was made by Baldwin Locomotive Works and Bethlehem Steel Export Corp. at the Baldwin docks near Chester, Pa., Nov. 16. The shipment consisted of ten locomotives, ten tenders and fifteen first-class passenger cars for delivery to the Chilean State Railways. Don Manuel Trucco, ambassador of Chile, received the cars on behalf of his government. S. M. Bash, vice president of Bethlehem Steel Export Corp., and Robert S. Binkerd, vice president and director of sales of Baldwin, conveyed greetings for American industry. The affair was followed by a dinner to the ambassador and to the consular officials representing Latin-American countries at Philadelphia. The passenger cars were built at the Harlan plant of Bethlehem Steel Co. in Wilmington, Del. They are steel coaches with wood interior finish, weighing 102,000 pounds, carried on two 4-wheel structural built-up trucks. Gage is 5 feet 6 inches

Production

GAINS of 1, ½ and 15 points respectively, in the Pittsburgh, Chicago and Wheeling districts lifted the steel rate up fractionally to 28 per cent. Some encouragement may be derived from the fact that increases in the major districts seem to be fairly steady. A further slight increase is expected this week due to additional capacity being put on in the Pittsburgh, Youngstown and New England districts. Details for various districts follow:

Buffalo—Down 2 points to 24 per cent last week, with nine open hearths in production. This rate is expected to hold this week, and no

(*Please turn to Page* 20)

Founders' Convention Urges Less Government in Business

REMOVAL of legislative restrictions on industry, clarification of existing regulations and acceptance of a policy by the federal administration that new laws be mutually beneficial to both business and labor, were proposed at the 38th annual convention of the National Founders association at the Waldorf-Astoria, New York, Nov. 14-15.

Speaker after speaker discussed the political situation and offered concrete suggestions on legislation tending toward improved business recovery. The convention was attended by 200 members and guests.

Officers were re-elected as follows: President, Thomas W. Pangborn, Pangborn Corp., Hagerstown, Md.; vice president, F. H. Clausen, Van Brunt Mfg. Co., Horicon, Wis.; commissioner, A. E. McClintock, Chicago; secretary-treasurer, J. M. Taylor, Chicago.

New members of district committees include: First, Thorwald F. Hammer, Malleable Iron Fittings Co., Branford, Conn.; second, W. H. Cole, Moore Bros. Co., Elizabeth, N. J.; third, D. C. Bakewell, Duquesne Steel Co., Pittsburgh; fourth, Ferris Taylor, Dean Bros. Co., Indianapolis; fifth, H. E. Muchnic, Locomotive Finished Material Co., Atchison, Kans.; sixth, L. S. Peregoy, Sivyer Steel Casting Co., Milwaukee; seventh, C. A. Brainard, Beaumont Iron Works Co., Beaumont, Tex.

President Pangborn, in opening the convention with a strong address, submitted definite proposals as to federal government policy for the attainment of recovery, concluding with:

Advocates Stabilization

We must balance the federal budget. For business can find no encouragement in a tendency toward financial instability in government. We must reduce federal relief. Reduced expenditures and a sound financial program would be the go-ahead sign for business which is the real method of affording unemployment relief.

We must stabilize our currency. Business is ready to contend with economic hazards but it cannot gamble with political hazards.

Government must remove itself from the field of competition with its own citizens and taxpayers.

Government must discontinue the policy of construction of public works projects in fields already amply served by private enterprise.

A labor truce should be declared. This is no time to attempt innovations in labor relationships, and section 7a has not clarified those relationships. Instead, the experience of confusion, destruction, loss of capital and wages thus far only tends to retard recovery.

Let us maintain a status quo: whatever has been the method of bargaining with employes, whether closed shop, open shop, individual bargaining, or employe representation plan, let it remain as it is with neither employers nor employes seeking to take an advantage of unusual conditions. That would put a stop to this agitation and endless argument and attention should be centered on the real objective, namely, that of stimulating national business recovery.

THOMAS W. PANGBORN

Re-elected president of the National Founders' association at its convention in New York last week

Our present sensitive economic machinery should not be made the occasion to promote the interests of any special group. Maintenance of status quo in labor relations at this time would do much to steady our commercial and industrial ship. Upon its progress all must alike depend. Labor cannot sink capital without sinking itself also.

These are steps which it seems to me, would encourage the investment flow of private capital into the industries of the country, restore confidence, stimulate industry and commerce, and bring us back to our normal American life.

As a result of the recent elections, the administration is probably more seriously concerned with the basic fact that the problem of recovery still faces the nation than before the poll, according to Virgil Jordan, president of the National Industrial Conference board.

Still far from recovery, results of the course thus far followed have been extremely irregular, as shown by curves of business activity during the last five years with the net result that industrial activity is not much higher. With the recent vote canvassed, the administration can now devote all time to the single purpose of recovery without resorting to political or partisan methods, he said.

By mid-1932 recovery actually got under way, according to Mr. Jordan, and by November of that year considerable progress had been made, both as to production and price levels. From that time to the present, progress has been governed by purely political factors, the speaker declared.

Progress toward recovery was also made from March to July, 1933, but by the latter date legislative methods of theory became effective. From that time progress has been irregular, each upturn at a somewhat slower rate.

Such business improvement curves will not be permanent until a less unfavorable attitude is imbedded in government's policy toward industry, in Mr. Jordan's opinion. The administration can no longer rest its case on the errors and deficits of the individual business man and business in general.

Get at Facts on Employment

Mr. Jordan declared present figures on unemployment are vague and unreliable. He suggested one of the first important factors was to determine the definite statistics; how many unemployed, where are they, former employment, ages and the likelihood of the number facing permanent unemployment.

Such a breakdown of facts is required for intelligent administration of the unemployment problem, he claimed; part of unemployment is artificial, but is in danger of becoming permanent, partly the result of business by politics.

Within six months, in Mr. Jordan's opinion, the question will be acute whether unemployed will go back through private industry or become socialized by the government. At least, the combination of the two appears to be unworkable, tending toward continuance of unstability. Nationalization of credit, power and transportation means, in essence, nationalization of all industry, and Mr. Jordan pointed out initial steps had been taken in all three.

But few steps are required to nationalize credit. The policy as to power is already in process, the speaker noting government activity in power and light producing plants. In trans-

portation it is well advanced. Nationalization of agriculture and labor would be next logical steps, should the policy be carried to a conclusion. The former might offer serious difficulties.

Five such steps would mean a complete change in form of government and its reconstruction would include some of the features already operative in Italy, Russia and Germany.

The alternative policy, re-employment by private enterprise, depends on a simple economic factor, reduction of operating cost, said Mr. Jordan. However, every move by the administration has been against this, he said. Mr. Jordan suggested government loans for payrolls could be made without adding to unit costs, add employment, and administration of the same could be administered by code authorities.

Would Keep NRA Unchanged

As to new legislation in the next congress, with the expiration of the NRA, he suggested its retention without change with the hope that its administration would improve. Mr. Jordan warned that with prevailing attitudes at Washington, industry was in no trading position—that if such was attempted it would lose more than it had when started.

Rapidity in the ultimate economic recovery depends on the elimination of two forces now retarding recuperative efforts, according to F. H. Clausen, the Van Brunt Mfg. Co., Horicon, Wis., and vice president of the association, who has been active in code administration at Washington. These are: Lack of confidence in industry by the national government and lack of confidence by industry in some of the alleged recovery plans of the government. Mr. Clausen is code director of the farm machinery industry.

Takes Opposite Viewpoint

Non-compliance by some industries with codes has grown by leaps and bounds in relation to those provisions outlining rules of fair competition in the distribution of competing products of industry, said Mr. Clausen. The NIRA should not be re-enacted or extended in Mr. Clausen's opinion. He said:

This law was enacted as an emergency measure and its continuation with recognized nonobservance will serve to prolong the emergency it was designed to mitigate. The increasing inability of some code authorities and NRA to enforce compliance with approved fair trade practice provisions directly implies that many code provisions which were voluntary in form are not so in fact. Any code system, without a general and affirmative support of the industries to which it applies, will fail through increasing nonobservance, and will continue a condition of uncertainty and lack of confidence.

It has been suggested by the administration that "the functions of the recovery act which have proved their worth may be made a part of the permanent machinery of government." Inasmuch as business itself must assume the obligation of compliance with the permanent laws enacted to control its operation, it has a like obligation of expression as to the form much proposed legislation may take.

New legislation, when enacted, should provide that each industrial group may formulate and put into effect rules of fair competition subject to governmental approval.

In Mr. Clausen's view the initiative and the responsibility should be upon industry itself. Not only the original initiative, but also all developments and changes up to the point of governmental approval should belong solely to industry. Those actively and responsibly engaged in an industry have that understanding of problems which is necessary if rules of industry conduct are to promote sound conditions in the industry.

National Debt Soaring

Discussing financial aspects of the new deal, J. A. Milholland, vice president of the Manhattan Co., New York, stressed the mounting government debt, saying in part:

The direct debt of the federal government is over 27 billion; there are several billion more of guaranteed obligations. Of the direct debt, almost 5¾ billion matures within a year. The government, therefore, must continually come into the capital market and if that market at any time becomes sufficiently distrustful of government obligations to refuse the new offering, the consequences can be extremely serious. For a time various government funds and agencies can buy bonds and the banks of the country can probably be influenced to increase their present very large holdings.

Should the banks not wish to invest in more government bonds; should they feel that it is not prudent banking to put too many eggs in one basket, and that it is not sound for the government to monopolize the lending resources of the country, then the demand for the nationalization of credit will be heard. That simply means forced loans.

No government whose financial policies inspire confidence has any need to find a home for its obligations, because the capital markets of the world will gladly absorb its offerings as long as the risk is a good one.

Commissioner A. E. McClintock reported 11 new members during the year, with 8 reinstatements and 22 having resigned or retired from business, a net loss of one—a good showing considering the long depression.

The association naturally has been confronted with more industrial relation problems. Never in the history of industry have labor unions conducted such a drive for members, methods in many instances being ruthless, with some breakdown in law enforcement where labor troubles have developed. In some instances it was shown that 95 per cent of employes join the union involuntarily.

Periodical physical examination of old and new employes for the detection of possible silicosis was advocated by E. O. Jones, consultant on industrial relations of the association, Mr. Jones having visited 200 plants of members during the year. He indicated such physical examinations, already accepted as definite policy, indicated silicosis detected were far out of proportion to the number of suits filed for compensation.

Laws Become Racketized

F. Robertson Jones, general manager, Association of Casualty and Surety Executives, New York, discussed problems of compensation for occupational diseases. In some states, Mr. Jones declared, workmen's compensation laws had developed into a medium for a racket and an excuse for the enactment of social insurance laws, the latter being grafted to the compensation statutes. In the matter of occupational disease insurance the speaker favored the establishment of a medical tribunal, free from politics, and empowered to establish a list of such occupations.

Speaking on "The Collective Bargaining Bugaboo—What is the Law Today," David R. Clark, of Fyffe & Clarke, Chicago attorney, had this to say as to the legality of the collective bargaining legislation:

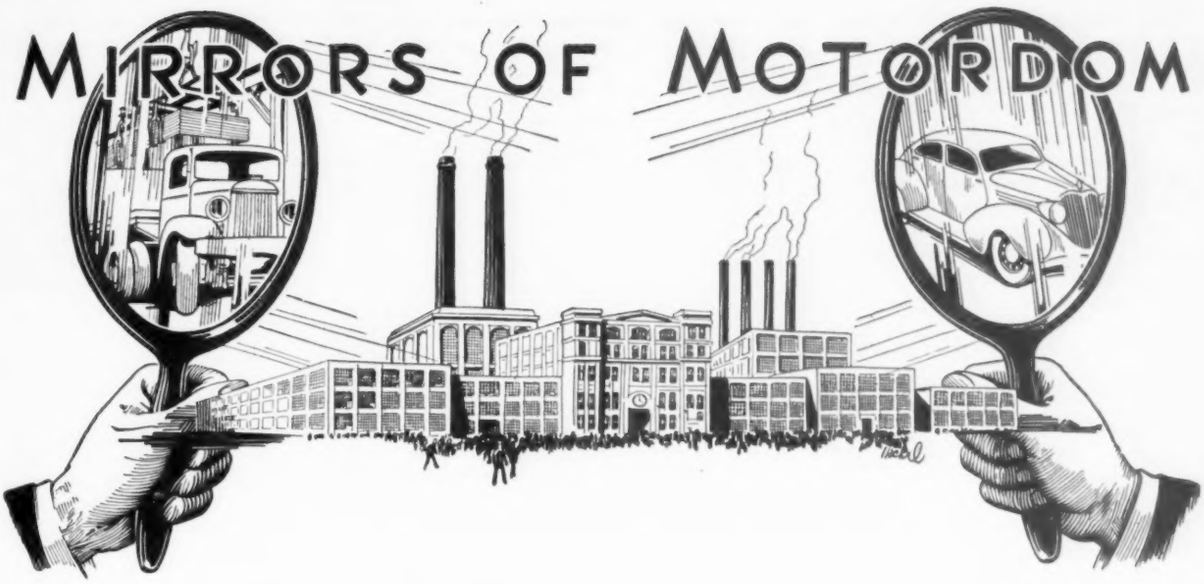
Outlines Restrictions

The only legal restriction upon employers today regarding collective bargaining by factory employes, is the prohibition of Section 7a against an employer corrupting or over-riding the will of employes through the abuse of the relation or opportunity he has as an employer—and, in my opinion, that restriction is unenforceable—at least against any manufacturer who has not agreed to it.

Executive orders, NRA releases, labor board decisions, and other pronouncements of executive boards and officials, to the contrary notwithstanding—it is only to valid law we must look—for, as the attorney general of the United States advised the President in June, 1934: "An executive officer cannot by his regulations, alter or amend a law. All he can do is to regulate the mode of proceeding to carry into effect what Congress has enacted."

More Business: Larger Space

Harry Trottner Steel Corp., Cleveland, has moved from 935 East Sixty-third street to a new plant at 12910 Taft avenue, increased volume of business requiring larger space.



DETROIT

PREVIEWS of new models before dealer gatherings last week signaled the start or near commencement of assemblies of 1935 offerings by certain manufacturers and the approach of an about-face in the drooping curve of total production.

Dodge, Ford, Hudson-Terraplane, Nash, Plymouth and Pontiac are among the first at the post, not including Auburn, Packard and Hupmobile which already have announced new cars.

Plans of some of the others, while approved, will require additional time to be translated into actual operations. General Motors' announced program of staggering new-car introductions over the year lightens preparatory work for this interest at present, while in a few instances a further reduction in dealers' stocks is desired before new models are made available.

NO TROUBLES THIS YEAR

While initial production will be light and in certain instances few except show cars will be ready by the end of the year, there is little likelihood of a repetition of a scarcity of cars such as developed in late 1933 and early 1934.

A year ago the tool and die strike was just ending and the delay in starting production of new models found some dealers for a time without cars. This year there has been no such interruption to die work and in the event that new cars are late in being introduced, manufacturers have compensated for this by additional shipments of present models.

Hudson called in its dealers last week to show them the 1935 models. Encouraged by a production gain during the first nine months of nearly 90 per cent over 1933, Hudson will extend its coverage of the medium and low-price fields in 1935 with the introduction of a third series of Hudson cars in addition to the Terraplane. This year the Hudson was offered in two wheelbase lengths.

Both the Hudson and Terraplane have been altered in appearance to give a more continuous and pleasing flow to their lines, an important feature being the all-steel roof which blends with the rest of the body.

Changes have not been confined to the Hudson and Terraplane body, radiator, hood, fenders and wheels, however, since mechanical parts have received considerable attention. Motor horsepower and torque have been increased. Contributing to better engine performance is a new piston design, which includes a rearrangement of the rings and which is expected to result in reduction in oil consumption of as much as 30 per cent.

In making the driver's seat comfortable for three passengers, the Hudson has eliminated the gear shift and the emergency brake levers from their customary positions. On the Terraplane the arrangement is conventional except that the brake is forward out of the way when not in use. Assembly of 1934 models has been completed, although brisk retail demand the past six weeks leaves dealers' stocks at a low level.

Supplying a foundation for his prediction that a further steady increase in replacement demand is certain as general business improves, Roy D. Chapin, president of Hudson, said last week that of the passenger cars now in use in the United States, 63.1 per cent are more than four years old and 43 per cent more than five.

ADOPT TUBULAR AXLE

Dodge unveiled its new cars before dealers in several cities Saturday and will be assembling 1935 models this week. Of interest in both Dodge and Plymouth is the dropping of coil springs for independent front wheel suspension in favor of a new leaf spring arrangement, coupled with a tubular axle, which is said to provide equal riding qualities at lower cost.

Unlike General Motors, Chrysler and other manufacturers which adopted some form of independent front wheel suspension this year, did not emphasize this feature or the use of coil springs among the principal talking points of their products, since in a number of instances it was a perfunctory move to meet competition. The change to some other type of spring consequently can be made without embarrassment.

Public reception of independent springing this year hardly can be termed enthusiastic, despite the generally favorable performance of the mechanism. One manufacturer which made the equipment optional found that whereas early in the year 90 per cent of buyers took its models with this equipment, recently only 20 per

Automobile Production

Passenger Cars and Trucks—U. S. Only

By Department of Commerce

	1932	1933	1934
January	119,344	130,087	156,907
February	117,418	106,888	231,707
March	118,959	118,002	331,263
April	148,326	180,713	354,745
May	184,295	218,347	331,641
June	183,106	253,387	308,051
July	109,143	229,357	266,575
August	90,325	232,855	234,809
September	84,150	191,800	168,872
October	48,702	134,683	120,000*

*Estimated.

Estimated by Cram's Reports

Week Ended	
Nov. 3	17,116
Nov. 10	15,920
Nov. 17	15,900

cent were willing to pay the additional cost in order to have it on their cars.

When it comes to a matter of extra dollars and cents, a certain class of buyers is lukewarm toward knee-action, axle-flex or what-not, and in cases where this design represents a fairly substantial cost item the tendency toward making it optional or toward a different and less expensive spring arrangement as standard equipment is seen as not surprising.

TEN MILLION CHEVROLETS

Chevrolet again will offer a standard series without knee-action but will increase its promotional work on these cars. The 1935 standard models are to be featured from the standpoints of performance and economy. Economy as compared with the master line will come not only from lower initial cost but also from reduced upkeep, since it is understood that different engines will be used in the two series.

Chevrolet produced its ten millionth car with appropriate ceremonies at Flint on Nov. 13, at the same time celebrating the twenty-third anniversary of the founding of the company. Eleven years were required to build the first million cars, while each of three years—1927, 1928 and 1929—witnessed production of more than a million units. Output in 1911 was 2999 cars.

Chevrolet has 60,000 more 1934 cars scheduled for production before the present two series are abandoned for new models. Weekly assemblies recently totaled over 12,000 units. While retail sales have been declining, there has been a shortage of four-door sedans in the standard line, this model having been introduced only a few weeks ago.

Last week Chevrolet had not decided on specifications for certain parts for new models, which accounted for the slowness in issuing releases to material and parts suppliers. Additional production of present models after Chevrolet's principal competitors had ceased assemblies also is believed to be at least partly the result of delays in completing plans for the new lines. The standard six is expected to be the first in production, followed by the master series, the reverse of the practice this year.

Pontiac still is regarded likely to lead other General Motors units in new car introductions. In keeping with the stagger plan, changes in Cadillas, La Salle and Buick are not looked for until next year.

Ford is about ready to resume assemblies. Chief distinguishing features of the new models are the long slope of the back, wider and longer bodies, increased tilt of the radiator grille and forward mounting of the motor.

Addition to the total length of the car over the 1934 measurement is placed at 14 inches, but this is understood to have been accomplished without changing the wheelbase.

Rear seats in five-passenger models are moved ahead of the rear axle. The radiator grille, still somewhat oval or heart-shaped, extends several degrees more away from the vertical than the current design.

While steel releases have increased the past two weeks, there are some instances in which deliveries have been completed and producers have no additional orders against which to ship. As assemblies get under way, however, a further pickup in releases is anticipated, with the placing of fairly substantial tonnages counted on by early December inasmuch as that period should see the effect of new models on total assemblies.

Hupmobile, which has announced its new low-price series for 1935, recently increased production to around 270 cars weekly. Reo, turning out more than 200 passenger cars and trucks, is preparing for new models which will incorporate marked changes in body design as well as a narrower radiator. Nash has been successful in curtailing dealers' stocks to a low level and is expected to be in production of new models soon. New features of the latter include a narrower front and increased slope to the body rear.

Plans have been made for refinancing and reorganizing the Studebaker Corp. which will make the White Motor Co. a separately controlled unit. Studebaker acquired 95.11 per cent of White common stock in December, 1932, but a minority interest of the latter blocked the merger. Studebaker creditors will receive the entire holdings of White stock under the proposed plans.

Oldsmobile is spending $2,500,000 to double its production capacity for 1935. This includes the cost of new machinery, enlargement of assembly lines and rearrangement of the plant.

ONE WAY TO TEST A CAR

Fearless and venturesome as he is, William B. Stout, automobile and airplane inventor and designer, would never have done it on purpose, but through a recent accident his new rear engine car received recently a test no proving ground could ever have afforded.

When his new car caromed off a falling telegraph pole into the path of an oncoming car traveling at 50 miles an hour, the safety factor of rear engine design received a severe test. With a large portion of the weight of the car concentrated in the rear, the car pivoted about its rear axle, falling away automatically from the blow of the oncoming car in much the same manner that a baseball player absorbs the shock of a hard thrown ball, utilizing principles of yielding resistance. The three passengers in the car, including Mr. Stout, escaped with bruises.

This new car by Mr. Stout, which has been on the road for a year and will shortly be built to order for private owners, utilizes aluminum and other light metals. Improved vision is claimed, with the engine in the rear, and although the car is no longer than a Ford the seats in one of the experimental cars can be grouped about a bridge table. It is presumed that the driver is not one of the four.

Production

(*Continued from Page 16*)

immediate change in production is seen for the district.

Youngstown—Unchanged at 31 per cent last week, with the possibility of an advance to 34 per cent at this week's start. Carnegie Steel Co. has added another open hearth at its Ohio works, increasing the active units at that plant to 8 of 15, while Republic Steel Corp. has lifted ingot output at its Lansingville plant by addition of one open hearth. Valley mill managers see steadily rising operations in the next few weeks.

Birmingham—Remained at 25 per cent last week, with no change expected in the immediate future.

Detroit—Held at 48 per cent last week, one producer still operating five open hearths and another four.

Pittsburgh—Gained 1 point last week to 21 per cent. Despite the fact that a leading interest continues to average barely 20 per cent, the smaller independents are all on improving schedules.

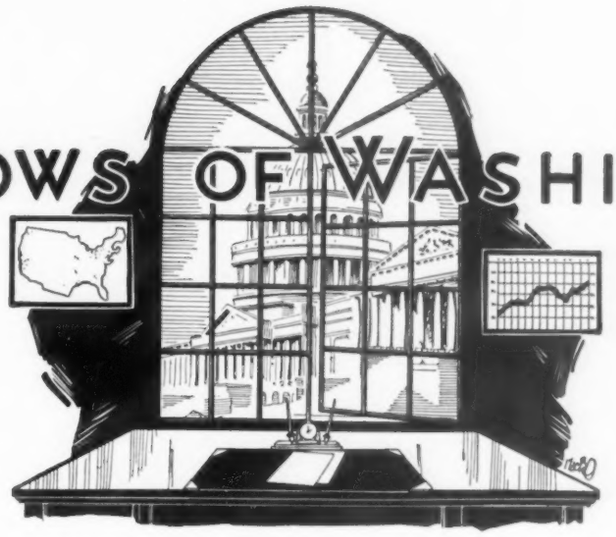
For this week, either a fractional or another 1-point gain will be recorded, in spite of the fact that National Tube Co. has closed its steel works at McKeesport, Pa. The Donora, Pa., works of American Steel & Wire Co. reopens Nov. 19 with its first open-hearth schedule since early October. In addition, Colonial Steel Co. is starting up an open-hearth furnace at Colona, Pa., for the first time in over a year and a half. The latter producer, however, has continued to operate electric furnaces in the interim.

Fourteen out of 60 blast furnaces are now active in the district. Carnegie Steel Co. has 7 of 32, Jones & Laughlin Steel Co. 3 of 11, Pittsburgh Crucible Steel Co. and Pittsburgh Steel Co., each 1 of 2, and Bethlehem Steel Co., 2 of 7. American Steel & Wire Co., in spite of resuming some operations Nov. 19 at Donora, Pa., will not blow in a blast furnace.

Wheeling—Jumped 15 points to

(*Please turn to Page 62*)

WINDOWS OF WASHINGTON



WASHINGTON

AFFIX the label "trial balloon" to every plan and project that emanates from Washington over the next six weeks, or until congress convenes in the first week of January, and in the main you will be right.

Varying sums for and types of public works; the proposed consolidation of all housing activities; revival of the program whereby industry would speed up and sell all excess production to the government; different brands of unemployment insurance; tightening-up of NRA compliance—all these primarily are attempts to take soundings.

For all practical purposes, there will be no appreciable change in the setup at Washington, including the government's attitude toward business, until congress returns, and probably also for some weeks thereafter. Even with Democratic control of both houses of congress so overwhelming, the legislative machinery will creak and move slowly.

Leaving Washington last Friday to lend his personal popularity and publicity to the TVA development and then on to Warm Springs, the President will not be back at his desk in Washington until Dec. 5.

MAP LEGISLATIVE PROGRAM

At Warm Springs and also at Washington on his return the President and his advisers, his wheelhorses in both houses, and to a lesser extent leaders in industry and business, will confer on the submission of a program to congress. This follows the pattern of negotiations prior to the introduction of the recovery act in congress in the spring of 1933.

More in the way of bait rather than threat, although it virtually constitutes the latter, industry is being given the impression that some extension of NRA, some form of unemployment insurance, some revision of tax laws, and other legislation calculated to speed "the more abundant life" are inevitable.

Industry's choice, therefore, is made to appear to be a mildly liberal program in co-operation with the administration or a radical program put over by a congress driven to a punitive mood by the opposition of industry.

In the meantime, organized labor is drawing up its defenses by proposing, as William Green did last week, that industry be made to bear the entire expense of unemployment insurance on the theory it can pass much of it along to the consumer. Industry's role will be to build up a situation to offset demand for outlawing the so-called company union.

CANNOT SPEND LOSSES

At this time, it appears that industry's most telling argument is the vast amount of red ink required to record its experiences in the last half of this year. More than anything else, the danger ahead of the administration through inability to finance its spending and reform programs because of industry's profitless condition is sobering the administration, from the President down.

This smacks a little of fattening the turkey for Thanksgiving, but it gives industry a chance in the meanwhile to find an "out."

At this distance it looks as if the coming session of congress will shape up something like this:

> The President's leadership will be accepted virtually without question—early in the session. He will experience comparatively little trouble getting his program through. Whatever opposition develops will be to make his program more radical.
>
> As the session wears on and the President's program is getting out of the way, members of congress will trot out their pet theories and projects. Fully cognizant of the President's inclination toward compromise, they will ask for about twice what they really expect to get.
>
> Congress always wears on a President's nerves, and adjournment is something to which the White House looks hopefully. On the other hand, the rugged individualists at this coming congress will tend to get out of hand increasingly as the session continues.
>
> The trend line of clamor and radicalism will rise from the beginning of the session to the end. Some trading may be necessary to get congress back home, and adjournment may be accomplished only by passage of some questionable legislation of the nature of the railroad pension and Frazier-Lemke bills, which were squeezed through in the final hours of the seventy-third congress.

DEAD CATS STILL IN AIR

While the lesser fry in the new deal setup at Washington continue more anxious, since the election, to put business in its place, the upper stratum that counts still is holding out the olive branch. But business need not be deceived that it has been fully reinstated. Private quips on the ineptitude of business are as numerous as ever in Washington, but the realization that recovery cannot be effected without a profitable industry is sinking deeper.

Washington still looks for a moderate rise in industrial activity, including steel, over the remainder of the year; a dip over the holidays slightly less than seasonal; a pickup in the spring that will top the highs of both 1933 and 1934; a decline in the last half of 1935 not quite so sharp as that of 1934; then a 1936 that may even pale 1929.

SECOND only to Postmaster General Farley as the politician of the cabinet, and probably a more re-

fined and a smooth worker, is the reputation of Secretary of Commerce Daniel C. Roper.

Shortly after NRA was set up in June, 1933, and General Johnson almost pre-empted the new department of commerce building, Secretary Roper created a business advisory and planning council to do long-term planning for the department.

While the explosive General Johnson was monopolizing the headlines, Secretary Roper was playing the long game, with the result that the general is remembered chiefly for his vocabulary and Secretary Roper lately has been carrying the banner for business recovery.

Incidentally, it can be stated authoritatively that the reassuring radio address of Secretary Roper made the Wednesday night after election (STEEL, Nov. 12, p. 19) had the approval of the White House. Including requests by readers of STEEL, the demand for this address by late last week had reached 15,000 copies, making it by all odds the "best seller" of any administration utterance since the President's inaugural address in March, 1933.

WOULD AMPLIFY STATISTICS

Last week this business advisory and planning council, on which Myron C. Taylor, chairman of the United States Steel Corp., is a representative of the steel industry, recommended that the department undertake an improved reporting of industrial statistics, amplifying the service introduced by former Secretary of Commerce Hoover.

The depression would be over for statisticians of the iron and steel industry if the recommendations of the council are carried out. Among weekly items proposed are reports on steel ingot production and on the manufacture of automobiles.

Among monthly statistical reports would be pig iron production, number of blast furnaces active and percentage of capacity in blast; steel ingot production with shipments from steelworks and rolling mills to automobile and parts makers, to railroad car, locomotive, building, bridge and track manufacturers, to building material fabricators and contractors, and to all other consumers; also production, shipment and stock data on furnaces and boilers, fuel oil burners, radiators, cooking stoves and ranges, steam fittings and valves; shipments, by number, of tin cans.

In the nonferrous metals, monthly data on production stocks and shipments of copper, lead, zinc, aluminum, brass and bronze and babbitt metal are recommended.

In the machinery classification an annual report on the consumption of iron and steel entering into the manufacture of farm implements is urged.

Also on the recommendation of this business advisory and planning council, the bureau of foreign and domestic commerce is reorganizing its marketing research and service division. Under the direction of C. T. Murchison, chief of the bureau, this division will undertake studies of marketing procedure and distribution data. A beginning will be made by gathering information on the per capita and per user consumption of consumer goods. In a way, this complements the increased activity in stimulating foreign trade in iron, steel and machinery as noted in STEEL for Nov. 12, p. 14.

Just before leaving Washington Friday the President made another gesture toward industry by inviting the council to meet with him regularly. This will give him a contact with several score leaders of industry.

H. P. Kendall, textile manufacturer and lecturer on industrial management, was elected chairman of the council last week, succeeding S. Clay Williams, now head of NRA. Harold C. Smith, of the Illinois Tool Works, Chicago, was made a member of the executive committee for the year beginning Dec. 1.

GENERAL JOHNSON'S successors in NRA are talking bravely of tightening-up on compliance and carrying on, yet there is a note about NRA headquarters that suggests a noted columnist was right in describing members of the new industrial advisory board as pall bearers rather than life savers.

The present policy seems to be one of holding on until congress convenes and acts upon a flood of legislation which would extend NRA on a revised basis.

Typical of the caution now dominating NRA counsels, the new contributions section set up by W. Averill Harriman will use moral but not legal suasion in dealing with delinquents on code authority assessments.

The routine will be that members of an industry will receive an official order allowing them 15 days to show cause why they should not pay. In 30 days the assessment is due, and if not met delinquents will be reported to the contributions section.

CODE AUTHORITY HOLDS BAG

But this section will not sue, for one thing wishing to avoid any semblance of encroaching upon the taxing power vested solely in congress. It will be up to code authorities to sue—a hot poker which it is believed few steel authorities will undertake to grasp.

Although the steel code authority has avoided any decision on making an adjustment for delivery by water, this situation continues to irk steel producers in the Pittsburgh district, who are losing the advantage of their fleets of barges by being compelled to charge the equivalent of an all-rail delivery.

The Dec. 1 deadline on a survey of steel basing points approaches rapidly. The executive order called for a joint survey by NRA and the federal trade commission, but the latter believes separate reports should be made. The report will go directly to the White House and any publicity will follow the President's approval.

TWO further gestures toward reassuring business—termination of loans by the Home Owners Loan Corp. in order to divert this business to private enterprise, and the lifting of the embargo on exports of capital and currency—do not dim the prospect that housing will prove the most effective aid yet devised to the steel industry.

Evidencing this, financial writers last week began to speculate that Republic Steel Corp. and A. O. Smith Corp. had improved stock market prospects because of their activity in the steel housing field. Both companies have important development work on steel housing under way and oustanding announcements are expected shortly. One big eastern steel producer is attacking the steel housing situation with fresh vigor.

Inquiries concerning construction of new homes and refinancing of mortgages apparently indicate high interest in housing. Local campaign committees are working in nearly 4000 cities, some making house to house canvasses. For house repairs, about $2,000,000 daily is now being put out. More than 10,000 banks have qualified for FHA loan insurance.

The need for co-operation of the steel industry with FHA is more evident each day. Two recent clip sheets supplied to daily newspapers for republication boost everything but steel. They urge repairing of foundations, refinishing of floors, modernization of plumbing, use of insulation, painting, installation of built-in ironing boards, reshingling, pointing of masonry — everything from new toilet seats to the use of chewing gum for repairing leaks. But no steel, inasmuch as no representative of the industry is co-operating with FHA in publicity work.

RFC officials last week again urged iron and steel interests to borrow for maintaining and increasing employment. It was announced that in September loans to the industry included Niles Steel Products Co., Niles, O., $150,000; Patterson & Koster Iron Works, San Francisco, $2500; Wells Architectural Iron Co. Inc., New York, $3500; Jones Machine & Foundry Co. Inc., Chattanooga, Tenn., $5000; Inter-State Foundry & Machine Co., Johnson City, Tenn., $6000; and Ballard Iron Works Inc., Seattle, $3000.

Industrial Men in the Day's News

WHITLEY B. MOORE has been made general manager of the industrial division of Timken Roller Bearing Co., Canton, O. Graduate of the University of Michigan, he served in the navy during the war and then joined the engineering staff at Timken, later becoming associated with the sales engineering staff. In 1921 he was transferred to the Pacific coast in charge of sales there, and in 1924 returned to Canton as assistant general sales manager of the industrial division. In 1930 he was made sales manager.

John L. Young, until recently district general manager in charge of the Pittsburgh office of Timken, has been advanced to assistant general manager of the industrial division at Canton. He joined the Timken organization in 1921.

Harry D. Robb, since 1925 active in sales engineering work in various territories for Timken, has been named district manager in charge of the Pittsburgh office. Harry H. Wood, a member of the company's engineering and sales staff in Canton since 1929, specializing in the application of bearings in steel mills, has been transferred to Pittsburgh and appointed manager of the rolling mill division.

□ □ □

I. H. Barbee, for many years engineer of the Link-Belt Co., Chicago, in Atlanta, Ga., and Philadelphia, is now in charge of the new Link-Belt

I. H. Barbee

plant at Atlanta, formerly the Bailey-Burruss Mfg. Co., physical assets of which were purchased by Link-Belt as noted in STEEL for Nov. 12, p. 25. All divisions of the company's Atlanta sales office are being moved to the Bailey-Burruss plant.

□ □ □

M. L. Bettcher, formerly general superintendent of the Duriron Co. Inc,. Dayton, O., has been appointed general manager, succeeding Dudley H. Miller who becomes executive vice president. Mr. Bettcher is a graduate mechanical engineer and joined the Duriron organization in 1920 as a salesman, later transferred to the manufacturing department.

N. E. Philpot, manager of the Duriron Chicago branch office for several years, is being placed in charge of the New York office, succeeding W. E. Pratt, resigned. Col. M. W. Smith, formerly manager at Buffalo, is now manager of the Chicago office, and W. A. Watkins has been transferred from the general sales department at Dayton to Buffalo as manager.

□ □ □

A. P. Marwick has been named sales manager of Burnside Steel Foundry Co., Chicago. He started in the employ of Pettibone-Mulliken Co., Chicago, in 1906 as a clerk, then became salesman for commercial manganese steel castings, in 1924 was made assistant manager of manganese sales, manager in 1927, and resigned in 1929 to become associated with Taylor-Wharton Iron & Steel Co., High Bridge, N. J., in the Chicago sales division.

□ □ □

Charles B. Lansing, president of the National Tile Co., Anderson, Ind., has been named general manager of the Ferry Cap & Set Screw Co., Cleveland. He will continue as nominal head of the tile company but will devote practically his entire time to management of the Ferry company. Present officers and the directorate continue unchanged.

□ □ □

J. L. Blackshaw, formerly associated with the research laboratory staff of the American Society of Heating and Ventilating Engineers in Pittsburgh, has been placed in charge of all heat-

G. G. Coolidge, Vice President and Director, Harbison-Walker Refractories Co.

He has had long experience in the refractories industry, particularly in the sales division.

In earlier years he was active for some time with a railroad and rail equipment interest.

From his first position as member of a district sales office, he has advanced steadily to his new post.

G. G. COOLIDGE, who as noted in STEEL for Nov. 12 has been elected a vice president and a director of Harbison-Walker Refractories Co., Pittsburgh, will, in another two years, have rounded out 30 continous years of service with that company.

Graduated from Yale university in 1904, he soon became connected with the Delaware, Lackawanna & Western railroad. A short time later he left the railroad and became identified with the Westinghouse Airbrake Co., Wilmerding, Pa.

In 1906 he was employed by Harbison-Walker and has been actively identified with this interest ever since. His first position was as a member of the Pittsburgh district sales office. Five years later, in 1911, he was made district sales manager at Pittsburgh. In 1921 he was appointed assistant general sales manager and in 1929 was named assistant to the president.

Mr. Coolidge is a resident of Pittsburgh and, aside from other affiliations, has been president of the Associated Charities of Pittsburgh.

ing, ventilating and related technical problems at the building products division of the Reynolds Metal Co., New York. He will supervise all tests on the company's metal foil insulation and will train the sales force in heating, ventilating and air conditioning problems as they apply to insulation.

□ □ □

Edward Nagel, for 20 years associated with the Detroit plant of Chicago Pneumatic Tool Co., has been placed in complete charge of the manufacturing of parts and the rebuilding of pneumatic tools for Master Tool Co. Inc., Cleveland.

□ □ □

Ernest M. Elkin has been appointed manager of the law department of Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. At one time he was in government service, in the departments of commerce, agriculture and the treasury.

□ □ □

Dr. Stewart Scrimshaw, for nine years personnel director of Kearney & Trecker Corp., Milwaukee, and more recently professor of economics and industrial relations at Marquette university, has been appointed director of the newly-created Milwaukee regional branch of the national labor relations board.

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Arthur L. Meyer, Alan Wood Steel Co., Conshohocken, Pa., has been elected president of the Steel Club of Philadelphia. L. L. Caskey, Republic Steel Corp., has been named vice president and F. L. Shants, Lukens Steel Co., secretary and treasurer. A. C. Buterbaugh, Sharon Steel Hoop Co., and William W. Deal, American Steel & Wire Co., have been elected directors.

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Sidney Langston has been appointed representative in charge of the Cleveland territory for Ex-Cell-O Aircraft & Tool Corp., Detroit, with headquarters in the Penton building, Cleveland. For the past seven years he has been Cleveland district manager for Kearney & Trecker Corp., Milwaukee, and previously was associated with the Pratt & Whitney Co. Cleveland sales office.

Hoadley Discusses Three R's —Relief, Recovery, Reform

The three R's of the depression—Relief, Recovery and Reform—and their influence on permanent employment were analyzed in an address on the "Problems Confronting the Durable Goods Industries," by Franklin R. Hoadley, vice president, Farrel-Birmingham Co. Inc., Ansonia, Conn., and chairman of the code authority of the gray iron foundry industry, delivered before the Providence section of the American Society of Mechanical Engineers, Nov. 9.

"Depression," Mr. Hoadley said, "is essentially a condition of unemployment. Recovery alone can bring about re-employment and an end to the depression. Re-employment is the only satisfactory form of relief. An aroused and informed public opinion will demand necessary reforms without the cruelty and injustice of impracticable and idealistic reforms which tend to retard employment.

"Therefore, since recovery will assure the greatest measure of relief and, since reform can be of little benefit without recovery, let us marshal the three R's of the depression into their proper sequence of Recovery, Relief and Reform, and put the greatest emphasis on the leader of these forces, Recovery."

Died:

RALPH M. DRAVO, 66, president of Dravo Contracting Co., Neville Island, Pittsburgh, and chairman of the board of Dravo Corp., at his home in Sewickley Heights, Pa., Nov. 11. Entering the employ of Illinois Steel Co. in 1889, after he was graduated from Lehigh university, he later worked for the Carnegie Steel Co.'s Edgar Thomson works at Pittsburgh, but shortly thereafter joined his brother in the F. R. Dravo & Co. The concern since has grown to be widely known in heavy construction circles, both in the building and marine fields.

Mr. Dravo was a director of Dravo-Doyle Co., Keystone Sand & Supply Co., Union Barge Line Corp., Davison Coke & Iron Co., and the Pitt National bank, all of Pittsburgh; the Fullerton-Portsmouth Bridge Co., Portsmouth, O.; Eastern Ohio Sand & Supply Co., East Liverpool, O.; Steubenville-Weirton Bridge Co., Steubenville, O.; Bridge Builders Inc., San Francisco, and Cumberland River Sand Co., Nashville, Tenn. He was a member of the Carnegie Hero Fund commission and one of the trustees of Lehigh university.

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John A. Andrews, associated with the Newport Rolling Mill Co., Newport, Ky.

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Robert A. Hock, 44, treasurer and office manager of the Columbia Axle Co., Cleveland.

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Duncan Rogers, vice president and secretary of the Rogers Bros. Galvanizing Works, Rockford, Ill., at his home in that city, Nov. 9.

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George Bryan, 43, manager of the American Steel & Bridge Corp., Duluth, in Chicago union station, Nov. 1, enroute to Peoria, Ill.

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Arthur J. Libert, 56, head of the Libert Machine Co. and Hudson-Sharp Machine Co., Green Bay, Wis., in that city, Nov. 9.

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John A. McFayden, 49, sales manager of the J. M. Nash Co., Milwaukee, woodworking machinery, in a grade crossing accident, Nov. 8.

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Harry F. Hopkins, 52, for 16 years auditor of the Colorado Fuel & Iron Co., Denver, and retired for the past 18 months, in Denver, Oct. 30.

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J. Fred Sheehy, 60, president of the Chicago Short Line railroad and for 30 years an executive of steel companies in the Calumet, Ill., district, at his home in Chicago recently.

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L. W. Fargo, 74, former vice president of the American Express Co., at his club in Chicago Nov. 14. For the past 20 years Mr. Fargo had been engaged in the management of his iron ore mining properties in the Mesabi district of Minnesota.

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Morris D. Robinson, 63, for the past 23 years general manager of the Philadelphia territory for Crane Co., Chicago, in Philadelphia, Nov. 1. At one time he was associated with the Illinois Malleable Iron Co. in Chicago.

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Rear Admiral Samuel McGowan, 64, paymaster general and chief supply officer of the navy department during the World war, with whom the iron and steel industry had many contacts at that time, in Laurens, S. C., Nov. 10.

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George B. Walker, 71, treasurer and director, Whitehead Bros. Co., New York, and for 51 years connected with that company, in Chatham, N. J., Nov. 1, after a brief illness. He was also treasurer of the Penn Facing Mills Co.

□ □ □

Rembrandt Peale, 76, president of Peale, Peacock & Keer Inc. and affiliated companies, bituminous coal operators in central Pennsylvania, and active in 1919 in connection with a survey then made of the bituminous coal industry, in New York, Nov. 11.

□ □ □

George S. Franklin, 53, senior member of the law firm of Cotton, Franklin, Wright & Gordon, New York, a foremost authority on corporation law and active in the organization of the Republic Steel Corp., as well as in the merger of Chrysler and Dodge automobile companies, at his home in Concord, Mass., Nov. 14.

Moderate Gains Forecast for European Steel Industry

AS USUAL the summer months have been marked by a general slowing down of business, but underlying conditions in certain European countries were favorable for a resumption of activities at the end of the year, particularly in the iron and steel trades.

Conditions were the most favorable in Great Britain; in Belgium and Luxemburg, and Italy, prospects showed signs of improvement. The position in Germany is causing considerable anxiety, owing to financial difficulties. The outlook is fairly good in Scandinavian countries, and eastern Europe shows some activity.

Domestic trade in the British iron and steel industry was distinctly quiet during the third quarter, and steel production decreased to 667,000 tons in August, the lowest point since the beginning of the year.

However, for each month the British steel output was substantially higher than in the corresponding month of 1933, and the tonnage produced during the first eight months was 5,892,500, compared with 4,301,600 in the corresponding period of 1933, an increase of 37.3 per cent.

British Foreign Trade Better

There was also an increase in exports of iron and steel, which during the first eight months totaled 1,428,373 tons in 1934 and 1,214,823 tons in 1933. Imports also increased correspondingly.

A reduction in the volume of production and trade last summer was to be expected, in view of the fact that during the preceding months a considerable amount of re-stocking took place. The increase of demand at the beginning of the fall shows, however, that users had not contracted for more than they anticipated using, and, viewing the present activities of the light foundry industry and of structural steel users, there is reason to believe that the trend of business will rise from now on and remain above last year.

In certain responsible quarters, however, hopes of large expansion are not too sanguine. The argument is put forward that re-stocking, for all industries generally, has been active during the past year or so, and that immediate signs of considerable expansion are not to be looked for. One important factor that mitigates against large-scale expansion is the unbalanced condition of the rest of the world, combined with the increasing difficulties of exporting.

Taking a moderately optimistic view, it can be said that there are fair prospects of a resumption of activities in domestic trade, at least equal to those that were hailed nearly two years ago as leading to a probable return to prosperity, but which fell short of the goal, since prosperity is barely reached by more than one or two industries as yet.

Mildly favorable conditions are present in the steel and iron trade of Europe and somewhat better volume is indicated for the latter portion of the year. These conclusions are the result of analysis of the situation in Great Britain and the Continent by Vincent Delport, European representative of STEEL, in the accompanying quarterly review. Problems remain to be solved in the political situation and these have a bearing on business development, in Mr. Delport's opinion.

The outlook is fairly good, but not sufficiently so to justify a complacent attitude.

The position as regards Germany is confused. Even during the summer months, activities in the German iron and steel industry maintained a high level, both in production and of sales. On the other hand, the financial position of the country is critical, Germany claiming that, owing to lack of foreign exchange, she is unable to pay her debts.

Foreign exporters, therefore, find themselves unable to grant further credits to Germany, which country now finds it almost impossible to buy raw materials necessary for her manufacturers. As a result, it is expected that certain fields of activity will experience a recession during the winter.

A disinclination to buy German goods on the part of foreign users is also noticeable. Consequently, German foreign trade is severely restricted and a crisis may occur at any time.

German Production Improved

The iron and steel industry is, however, in a more favorable position, owing to Germany's own resources. Steel output continues to expand, and for the first seven months the German steelworks produced 6,575,000 metric tons, compared with 4,072,000 tons in the corresponding period of 1933, an increase of 62 per cent.

Even German exports of iron and steel are on a higher level than last year, and domestic trade is active, thanks to the support obtained through government schemes to relieve unemployment, which shows a considerable reduction from last year.

As far as the immediate future is concerned, German policies are viewed by other countries with considerable anxiety.

Of the major steel-producing countries, France is the only one whose output of steel is lower than that of last year. The output for the first seven months was 3,580,000 metric tons, against 3,898,000 tons

(Please turn to Page 82)

Steel Output of European Countries

Metric tons, 000 omitted

	France	Belgium	Luxemburg	Germany	Great Britain*	Saar	Italy
June	512	253	165	1,003	758	173	154
July	511	248	160	1,036	667	156	161
July, 1933	581	212	148	641	568	153	158
First 7 Mo., 1934	3,580	1,895	1,092	6,575	5,175	1,105	1,057
First 7 Mo., 1933	3,898	1,682	1,150	4,072	3,750	947	1,027

Iron and Steel Exports of Europe

Metric tons, 000 omitted

	France	Belgium and Luxemburg	Germany	Great Britain*
May	266	295	203	191
June	276	319	214	204
July	254	316	213	197
First seven months, 1934	1,802	2,123	1,445	1,234
First seven months, 1933	1,605	2,089	1,170	1,067

*Gross tons.

EDITORIAL

If We've Learned a Lesson, Next Drive Will Suceed

LAST summer a Canadian phrase-maker hit upon an apt description of the methods employed by the United States government to restore prosperity. The expression, which enjoyed some vogue in the Dominion, was to the effect that "Uncle Sam is purchasing himself a recovery before paying for his depression."

Today this friendly jibe at our boot-strap tactics is made even more significant by a comparison of the progress of recovery in the two countries. It happens that certain indexes* of industrial production for both are on the same base (1926 = 100) and that at the beginning of 1933 both were just above 60 (U. S. 61, Canada 62.6). The index for the United States climbed sharply to a high of 89.9 in July, 1933, declined to a low of 67.6 in November, again mounted to a peak of 79.8 in May, 1934, dropped abruptly in June and July and has been fluctuating in the sixties and seventies since that time. On the other hand, the index for Canada, moving more slowly and steadily, climbed to a high of 90.2 in September, 1933, eased off gradually to a valley of 84 in February, 1934, mounted sharply to 92 in March, and, touching 99.9 in May, 99.8 in August, and 97.1 in September, now is easing off.

Recovery in Canada Is Free from Drastic Relapses Suffered in United States

From these statistics it is evident that our northern neighbor, pursuing methods more nearly orthodox than our own, has excelled us not only in the extent of recovery but also in the orderly manner in which it has been achieved. The United States, as in the case of Canada, has enjoyed two definite upward movements in industrial production since January, 1933. But whereas each of these spurts was followed by a drastic relapse in the States, the longer and steadier ascending movements in the Dominion were followed by only moderate or minor recessions.

That industry under the maple leaf has been able to hold its gains better that its contemporaries under the stars and stripes, is due in large measure to the fact that its government administration co-operated with business and finance in the interest of recovery, whereas our own administration, after discrediting and alienating business and finance, attempted without their co-operation to put over a program consisting of 25 per cent recovery and 75 per cent reform. Canada is in an enviable position; the United States still is faced with the problem of undoing its recent mistakes.

Hope that in this country the lesson of the past 20 months has been learned, that many mistakes will be corrected and that the next movement toward recovery will be attended by more intelligent co-operation by all factions is heightened by numerous significant developments in the past six weeks. The government administration is working more harmoniously with business and finance. Its leaders apparently see that industry must be assured of profits if employment is to be increased and if the high cost of government is to be financed properly. Almost every aspect of the administration's attitude toward industry has changed for the better since the date of the President's ill-advised Green Bay address.

Modification of Artificial Features Is Important In Approaching Drive for Recovery

This reversal of policy is both timely and fortunate. It is timely because it has occurred in time to become effective in the next drive toward recovery, the beginning of which is evident now. It is fortunate because it enables business and finance, which were stymied by the antagonistic attitude of the brain trusters in the two previous recovery movements, to join enthusiastically and effectively with the administration in the approaching offensive against the depression.

It is extremely important that this try for recovery be handled so that when the upturn has run its natural course, the subsequent reaction will not wipe out most of the gains, as it has in the previous two attempts. To accomplish this goal, the administration, industry, finance, labor and the public must realize that some of the artificial devices which were emphasized so strongly in the 1933 and 1934 drives must be modified or eliminated. Sooner or later we must face the realization that high unit costs, pegged by virtue of minimum wages, maximum hours, restricted capacity, continual foment in labor relations, and other artificialities, while defensible for short periods of emergency, in the approaching campaign may hinder rather than aid recovery.

*The Canadian index is adjusted for seasonal trend. The index for the United States is that compiled by the Standard Statistics Co. Inc. and is corrected for seasonal variation but not for secular trend.

THE BUSINESS TREND

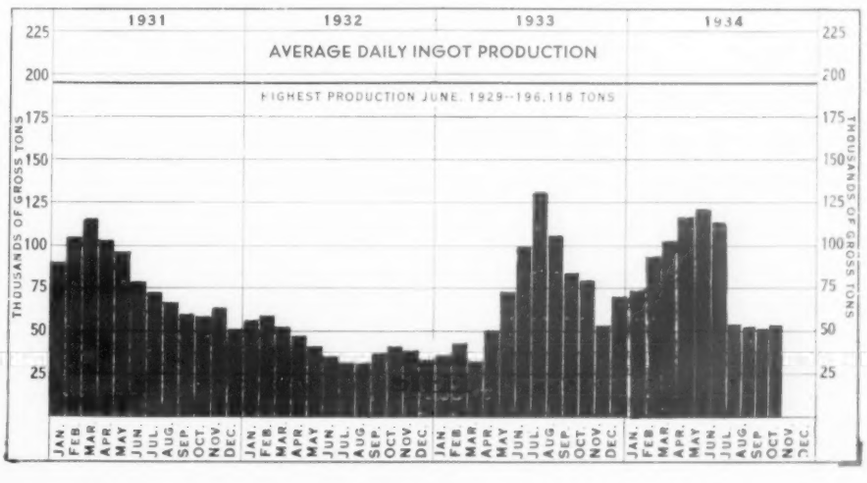
Path Is Being Cleared for Gains in Industrial Activity

PROSPECTS for improvement in industrial activity are somewhat brighter. Recent reassuring statements by government spokesmen—particularly the radio address delivered by Secretary of Commerce Roper on the day following election—have allayed much of the uncertainty as to certain policies of the Roosevelt administration. This improvement in sentiment is accompanied by certain developments in actual business which should prepare the way for steady gains in the near future.

While the trend upward is only faintly indicated by current records of business, the more promising outlook is more clearly defined than at any time in months. Electric power output for the week ending Nov. 10 was up from the previous week. Revenue freight car loadings in the same week totaled about 600,000 cars, a slight decline but a relatively good showing considering the seasonal trend in November. The rate of steelworks operations again increased slightly. Against the satisfactory records of these three industrial barometers is the continued easing off of activity in the automobile industry. When the assembly of motor cars is stepped up—as it will be within the next month—the now feeble trend upward will be stimulated. Recent gains in orders for machine tools, railroad motive power, structural steel, engineering work, etc. reinforce this promise of increased industrial activity.

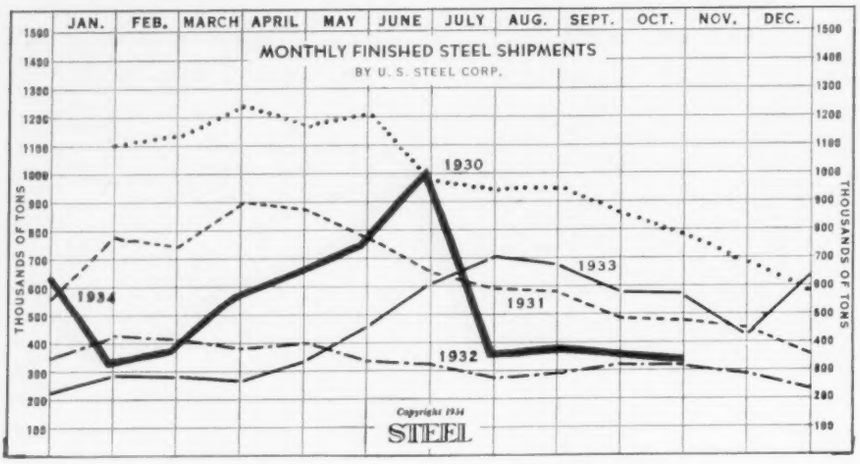
Gain of Nine Billion Dollars in National Income Signifies Expanding Prosperity

Encouraging to those who watch long term movements of business is the estimate by Brookmire that the income of the American people for 1934 will be $58,540,000,000, a gain of $8,891,000,000 over the $49,559,000,000 income for 1933. This authority, in *Brookmire Economist* for Nov. 6, points out that year-to-year changes in national income usually occur in broad curves without abrupt reversals, and intimates that the 1934 gain of nine billion dollars, following the low point of income in 1933, "indicate's that the long distance trend of prosperity has begun definite expansion."



1934	Tons
Oct.	54,146
Sept.	50,065
Aug.	50,495
July	58,903

1933	Tons
Oct.	80,188
Sept.	87,811
Aug.	105,058
July	126,734



Tons

October, 1934	343,962
September, 1934	370,306
October, 1933	572,897

Finished Steel Shipments Down in October

Shipments of finished steel products by the United States Steel Corp. declined slightly during October. Total shipments during the month were 343,962 tons, a decline of 26,344 tons from the movement of the preceding month and compares with 572,897 tons in October, 1933. For the ten months ended Oct. 31 shipments by the corporation totaled 5,151,124 tons. This compares with 4,729,955 in the first ten months of last year.

Railroads Earn 1.34 Per Cent On Investment in September

Class I railroads during September had a net operating income of $41,020,484, which was at the annual rate of return of 1.34 per cent on their property investment. While this shows a slight improvement over the $39,677,337 earned in the preceding month, it is considerably below earnings in September, a year ago, when the leading carriers earned at the rate of 1.97 per cent on their investment. In nine months net income totals $342,609,842, compared with $341,457,795 in the comparable period last year.

1928 1929 1930 1931 1932 1933 1934
MONTHLY RAILROAD EARNINGS
NET OPERATING INCOME FOR CLASS 1 ROADS
COMPILED BY BUREAU OF RAILWAY ECONOMICS
MILLIONS OF DOLLARS
Copyright 1934
STEEL

September, 1934	$41,020,484
August, 1934	39,677,337
September, 1933	60,608,883

1928 1929 1930 1931 1932 1933 1934
INDEX OF MACHINE TOOL ORDERS
AVERAGE MONTHLY SHIPMENTS 1926=100 PER CENT
COMPILED BY NATIONAL MACHINE TOOL BUILDERS ASSOCIATION
PER CENT
Copyright 1934
STEEL

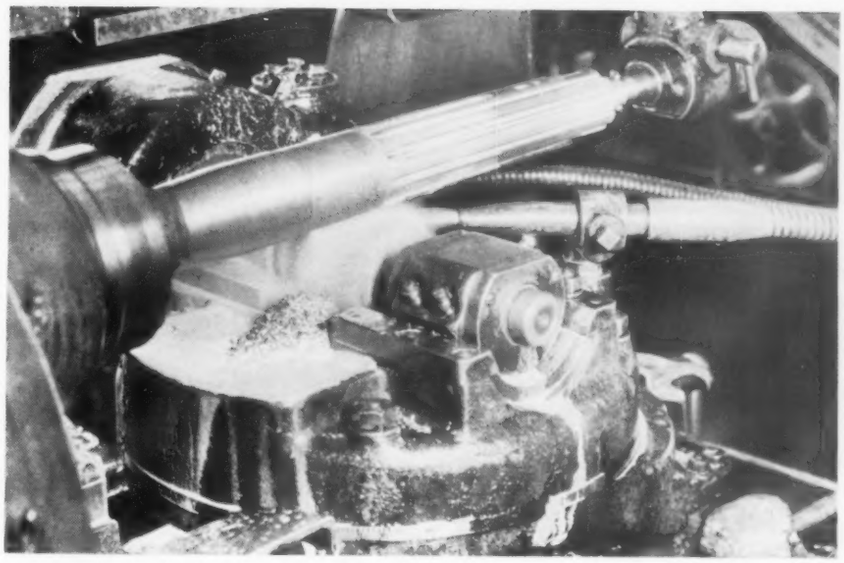
Per Cent

October, 1934	40.5
September, 1934	37.4
October, 1933	33.3

October Machine Tool Orders Highest Since May

The improvement in machine tool orders, as indicated by the three months' average a month ago, has been confirmed by the October volume of new business, which surpasses any month since May. The October index of new orders advanced nearly 9 points to 43.9 and compares with 37.2, a year ago. As the result of this sharp uptrend the three months' moving average shows a gain from 37.4 to 40.5 in October and compares with 33.3 in October, a year ago.

(Prepared from a paper presented before the Production meeting of the Society of Automotive Engineers in Detroit, Oct. 10-11. Illustrations through courtesy of the Sun Oil Co., Philadelphia)



Application of emulsion to a hobbing machine cutting splines on transmission shafts to full depth. Much misunderstanding and superstition now exists in the manufacture, purchase and use of cutting oils

CUTTING OILS AND FUNDAMENTAL CHARACTERISTICS IN THEIR SELECTION

BY W. D. HUFFMAN

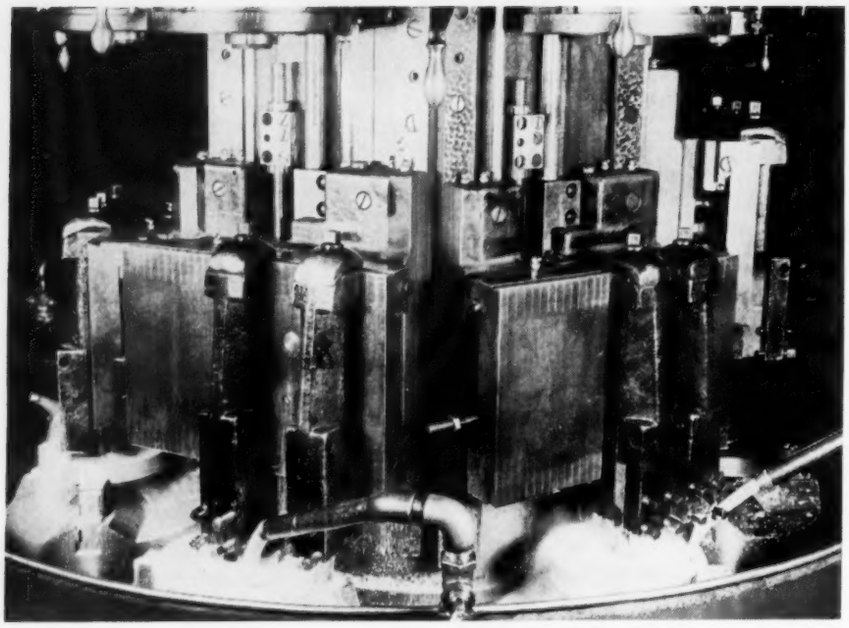
Chief Chemist, Chevrolet-Forge Division,
General Motors Corp., Detroit

SINCE the first developments of high-speed transportation, the principal items entering into the building of automotive equipment have been the making or fabricating of metal parts and their assembly into satisfactory working units. During the past ten years these problems have been intensified and broadened in scope by changes and advances; first in the quality of the material from which the parts of a complete unit are made and second by the necessity of devising methods by which these parts could be fabricated rapidly, economically and accurately. With introduction of harder, tougher metals and automatic high-speed cutting and grinding machinery, the problem of providing suitable cutting oils has reached a point where exact and scientific knowledge of the nature, use and application of these cutting oils is a necessity.

Aside from tool and machine design, little is found in technical literature of really scientific value concerning ways of maintaining tool life, conserving power and machinery, and facilitating operations. Certainly, the selection and application of cutting oils is of great importance and is worthy of study.

One frequently finds, even in large, modern shops, a condition of general ignorance as regards proper use and purpose of cutting lubricants. Too often experience and shop tradition are the sole guides in the selection of a given cutting fluid. The subject is not difficult and it certainly seems of a paramount importance that the knowledge and experience acquired should be correlated and some standard practice adopted. A great deal has been accomplished already along this line by two unbiased and competent observers, Geschelin and Boston; but it is time that their work should be supported and the proprietary tendencies removed from the subject. It is believed that there are too many nostrums in the cutting oil market.

It is popularly believed that cutting oils serve two general functions, namely, as coolants and as lubricants. As lubricants, they lubricate the area between tool and chip, although one may wonder what is meant by lubrication under pressures of 100,000 pounds which some observers maintain is reached. Nevertheless, we know that they are effective and are tool and power preservers. Aside from these functions, cutting oils are useful in washing away accumulated chips, giving a bright



One requirement of a good cutting emulsion is high emulsibility. Here is shown the application of an emulsion to a vertical turret lathe

and smooth finish and acting as rust preventives. These latter purposes in all probability will be incidentally accomplished in the selection of a proper oil for one of the two general functions.

Two general types of oils are available, the so-termed soluble or emulsifiable type and the straight cutting type. The soluble oils mix or emulsify in all proportions in water; they are primary coolants but also have some lubricating action. If properly made they generally are good corrosion preventives. Many times their emulsions are used solely as corrosion preventives. Because of their low cost, it would seem advisable that their use should be encouraged whenever possible, and it is quite certain that in many operations, where now more expensive oils are used, they could be advantageously substituted. There are two types of soluble oils, those which are principally or entirely of mineral oil origin and those which contain an appreciable amount of saponifiable materials or soaps. Either may make stable or effective emulsions, but the former apparently are more stable and resistant to unfavorable conditions.

Straight Cutting Oil Types

Straight cutting oils offer a greater range of composition and likewise a greater field for individual preference. They usually contain one or all of the following constituents: Mineral oil, saponifiable oil, and some nonmetallic element, such as sulphur, which may be reasonably supposed to have some extreme pressure lubricating properties. Mineral oils never have been considered all-purpose cutting oils, but many can remember when lard oil was the basis on which all cutting oils were evaluated and it was only the idea of cost that was capable of diverting preference to other types. At present we have treated mineral oils without any saponifiable matter in them, taking the place of the former types and giving as good, if not better, performance.

Under given conditions, we know that mineral oil with addition of saponifiable matter will perform satisfactorily in a certain operation. We know also that a sulphurized mineral oil will perform the same operation with equal satisfaction. Therefore, the problem involved is, just what is that characteristic inherent in each oil which gives the satisfactory performance, and in what amount does each of the selected ingredients supply that characteristic? Is it an oiliness which the saponifiable matter supplies, or is it extreme pressure lubricating properties which both the sulphur and saponifiable matter give? If the former, certainly that could be obtained in a proper selection of mineral oil; if the latter, surely less expensive oils can be supplied.

In an attempt to reach some degree of standardization, it is hardly possible that there would be prevented any investigation, research, or introduction of new and better cutting fluids. There would be no discouragement of progress, for a competitive market always would stand as a safeguard; but a great gain might be accomplished in the dissemination of knowledge about the constitution and the applications of cutting oils. The writer believes that for every cutting operation a given type of cutting fluid can be used and that for many other operations the same type will give equal satisfaction. With the present knowledge of the chemistry of cutting fluids and engineering in cutting operations it is possible to simplify greatly the field of application and uses of this material.

In large shops the selection of the cutting fluid is left frequently to the decision of the person in charge of a certain operation. At times it is not at all impossible to find five or six different types from as many different sources, their selections being determined by such whimsical notions as odor, color, and apparent viscosity. Usually, chemical analysis and investigation reveal no justification for such varied selections. There may be a perfectly good oil purchased for general use, say, in tank storage, and at a price which would recommend its application wherever possible. The chances are that a certain mixture formed with this oil and light paraffine would do the job and save considerable expense.

Simplification Is Urged

Assuredly, this is a condition which is hardly justifiable in the light of modern plant management. It is evident that a classification of cutting oils, together with an organized outline of their applications, would be of inestimable value in simplifying plant operation. Oil engineers recognize this fact and the author believes the more reputable companies supplying the material would welcome the approach of a more rational simplification.

At this point it might be of interest to note the importance of laboratory investigation and control. Wherever possible, the laboratory should co-operate in the selection and inspection of cutting oils. An examination of incoming shipments will insure against lack of uniformity and substitution of products. Especially with soluble oils, which do not possess the stability that other types do, is laboratory examination most valuable. An incipient tendency to separate, or a lack of satisfactory emulsibility, can be detected easily by laboratory control, and a great deal of argument and expense avoided. Furthermore, emulsion in use can be examined daily and knowledge of its condition obtained in a few minutes. Many times when laboratory observation is lacking, good oils are received without favor and objectionable material given credit not deserved. Too much cannot be said in favor of co-ordination between laboratory and shop.

Might it not be advisable also that each shop have some technical person to whom the cutting oil manufacturers can impart their information?

experience and data? The lubricating engineer seldom finds the man with whom he contacts in the shop sufficiently schooled in petroleum technology to discuss the important phases of cutting oil manufacture. Because of a lack of this particular experience, the latter is usually unable to evaluate the information.

Laboratory investigation usually parallels the stressed characteristics of the specification. The specifications usually are formed from certain conventional ideas as to what are necessary valuable qualities of oils. These qualities may or may not be determinants in the successful use of the lubricant. Soluble oils sometimes are difficult to analyze and can be torn apart only by a most skillful analysis, and then it is questionable how important the analysis would be. Usually, all that one desires to know is its emulsibility, its rust preventive properties and its tendency to separate. Then what would ordinarily be necessary would be to make a small amount of emulsion with the oil and the water and examine after 24 or 48 hours. The thing of greatest importance is that it shall emulsify and not separate.

Method of Evaluation

With the non-emulsifiable cutting oils it is customary to evaluate the oil from the following: (1) Specific gravity; (2) viscosity; (3) flash; (4) fire; (5) free acid; (6) saponifiable matter; and (7) sulphur. At one time the properties as determined by this outline were considered of great importance and frequently rejections of shipments resulted from even a slight variation from the specification set for a given material. Today, consumers of cutting fluids in general are taking a different attitude toward the significance of these properties. As a group, these properties may be of value in making known to the laboratory man the history and nature of the material, but, unless laboratory tests are made in conjunction with production tests, some false conclusions may result.

Specific gravity, flashing point, firing point and probably even viscosity are characteristics which are on debatable ground when it comes to making a proper evaluation of a cutting fluid. A given specified specific gravity may so limit a supplier that he may be forced to use certain raw materials, but it certainly cannot in any way assure the buyer that he will receive any more useful product. The flashing and firing points, within certain obvious limitations, may be placed in the same group with specific gravity. How often does the consumer specify a certain flashing point and then have the production man blend with it a lighter oil, maybe even kerosene? The importance of viscosity as stated before is debatable. Opinions given by about 20 different observers show about 50 per cent disagreement. It has been stated, by Boston that he believed viscosity is of value only in retaining within the oil those ingredients which are necessary for efficient cutting operations. Certainly all of us have seen work, where a heavy oil was considered absolutely necessary, done and done well, with oil of only half the viscosity formerly used.

But when we come to consideration of the introduction of saponifiable material, or sulphurized material into a mineral oil, we apparently have arrived at a vital point. These additions unquestionably give characteristics to the oil that it does not naturally contain. It has been intimated before that it might be possible to eliminate fatty material, but at present it is fairly well established that it aids in cooling and lubrication. Sulphurized oils have been in use for so long and their effectiveness so well known that it is unnecessary to discuss their merits. There is still some disagreement as to how much sulphur is needed, but that may be more or less determined by the amount of blending done in the shop or refinery.

Summarized, the fundamental characteristics governing the selection of cutting oils are as follows:

I. Soluble cutting oils.
   1. Ability to emulsify.
   2. Tendency to remain stable without separation.
   3. Tendency to prevent corrosion and give satisfactory finish.

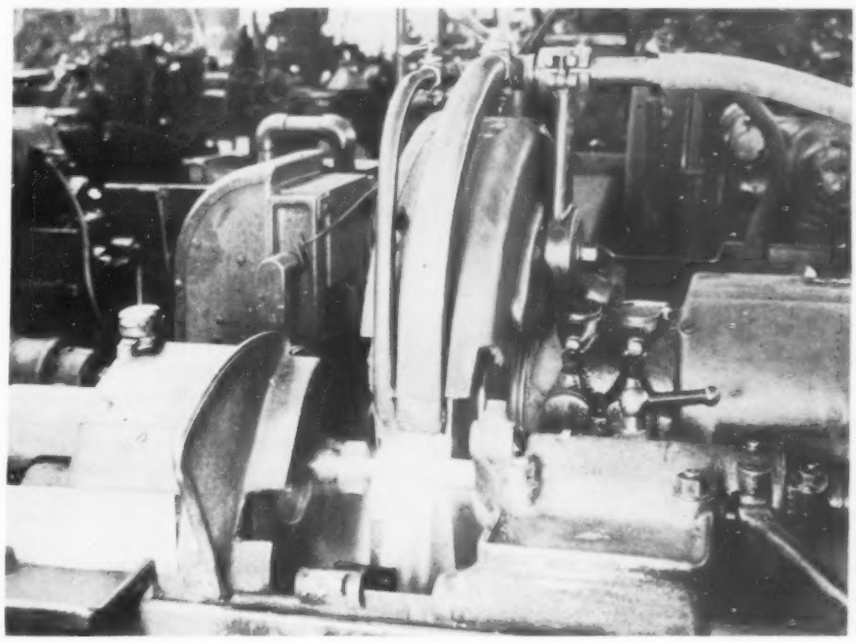
II. Non-emulsified cutting oils.
   1. Quantity and nature of saponifiable material.
   2. Quantity of combined sulphur not in natural combination.

From this summary, it would seem reasonably logical that if the supplier and consumer could meet on common ground, it might remove a great deal of misunderstanding and superstition which now exist in the manufacture, purchase and use of these materials.

Infection Is a Problem

Another question involved in the selection of cutting oils, and one which usually comes up after a given oil has been in use for sometime, is that of infection. Rarely has one who has had anything to do with handling oils of any kind escaped this problem, and almost always there is involved a controversy. The companies marketing the oil have, as a whole, spent much money and time in investigating the apparent spread at times of infection among workers who necessarily must come in intimate contact with petroleum lubricants. Frequently the consumer, who necessarily holds a certain responsibility as regards occupational diseases towards those under his employ, is at a loss as to what to do at the appearance of these skin eruptions. It is no more than natural that he should look to the nearest probable cause of his trouble.

Of course, the oil is invariably given the blame, a controversy started, and often the vendor must find another place to sell his product. Certainly it is not to be assumed that the oil is never a carrier of bacteria, but we may be reasonably certain in stating that actual bona fide cases wherein spread of infection may be blamed to oil are extremely



This shows the application of emulsion to a cylindrical grinding machine. What constitutes a good grinding lubricant at present is a matter of traditional opinion

seldom in occurence. Obviously mineral oils are not media in which bacteria may propagate satisfactorily, and in the sulphurized or chloride oils one would hardly suspect that they could exist at all. Likewise, in the soluble oils, a certain degree or rather excess of alkalinity should, we think, act in some respect as a disinfectant.

It is not uncommon for one to receive a negative report from the bacteriologist even when skin eruptions are prevalent among those working about machines. It might be suggested that sanitary working conditions and cleanliness may often solve a problem of this nature and save a great deal of investigation and worry. Furthermore, it is understood by all that certain persons, more than others, probably due to unusual skin formation or bodily function, are susceptible to petroleum or alkaline irritations. Frequent change of clothing and careful personal hygiene often results in very gratifying results.

Greater Use of Emulsions

Concerning the application of all types of cutting oils for mass production manufacturing, there remains a great deal of knowledge yet to be disseminated. Often there is not the proper discretionary judgment used in their selection and application. Of course, it is not easy to select a satisfactory oil for a given piece of work when all the difficulties to be encountered are not known. But with all this in view, the major problem is to find a type of oil which will supply the greatest number of needs or give the most successful operation on the greatest number of jobs. One approach to the solution of this problem may be found through the more general use of emulsions. There is a trend toward the greater use of emulsions and it is believed that when their possibilities are understood their use may be enlarged.

Because of the increase in manufacturing schedules, machine tool manufacturers recently found themselves in the position of designing new equipment, which would remove metal more rapidly, though many times the floor space was limited in an already over-congested shop. As an example, one of the interesting developments has been the addition of surface broaching equipment either in horizontal or vertical plane. These machines, to a great extent, will replace the milling machines.

It is interesting to note that when these machines first came into production, there was little or no information tabulated as regards the most advisable cutting oil to be used, and so for a long period various types of non-emulsifying cutting oils were used on this equipment. Cutting oils composed of sulphur, fats and a combination of both, with mineral oil, have been used for considerable time with reasonable results. However, there always has been and probably always will be excessive consumption of oil on high production types of machines, the carry off usually is great and this leads to exorbitant expense.

The question to be considered here is whether a lubricant of extreme pressure tendencies is desirable, or one to withstand the condition of high temperatures. It is understood that considerable work is now being done on this problem and that emulsions have been found to be desirable on a great many jobs. It seems advisable that these data should be co-ordinated and tabulated so that they would be available to many consumers. An emulsion should be a desirable application on this type of equipment, in that it furnishes a principle of high refrigeration as well as some lubrication, and should there be high temperatures involved, the refrigeration should and will have a tendency to improve the life of the broach, which is a most important member of this machine.

The metallurgist has contributed a great deal toward the solution of the problem of surface broaching. It has often happened that a cutting lubricant has been held in disfavor, when the problem was really one of machine ability. Frequently, in encountering machining difficulties, the solution has been found in the metal specification or heat treatment and not in the selection of the proper cutting oil or emulsion.

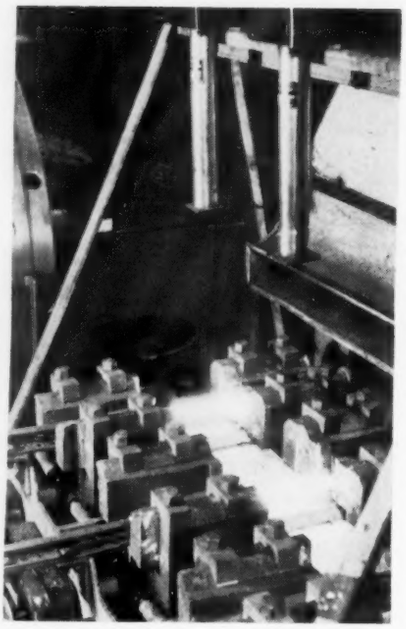
Another interesting operation of mass production is that of grinding. It is probably one of the finest processes, for in this operation we reduce metal to such tolerances as 0.0001 inch. In view of experiences of the past, considerable investigation should be made with regard to grinding lubricant or emulsion. We usually find in an industry a lot of traditional opinions as to what constitutes a good grinding lubricant. It is not unusual to find some person requesting that the piece should have a high lustre, which may or may not be indicative of a good finish. Experience has probably proved that with the average type of grinding machine the tankage for holding the grinding lubricant is generally too small when consideration is given to the turbulences produced by the emulsion flowing to the abrasive member and back into the tank.

Removing Foreign Material

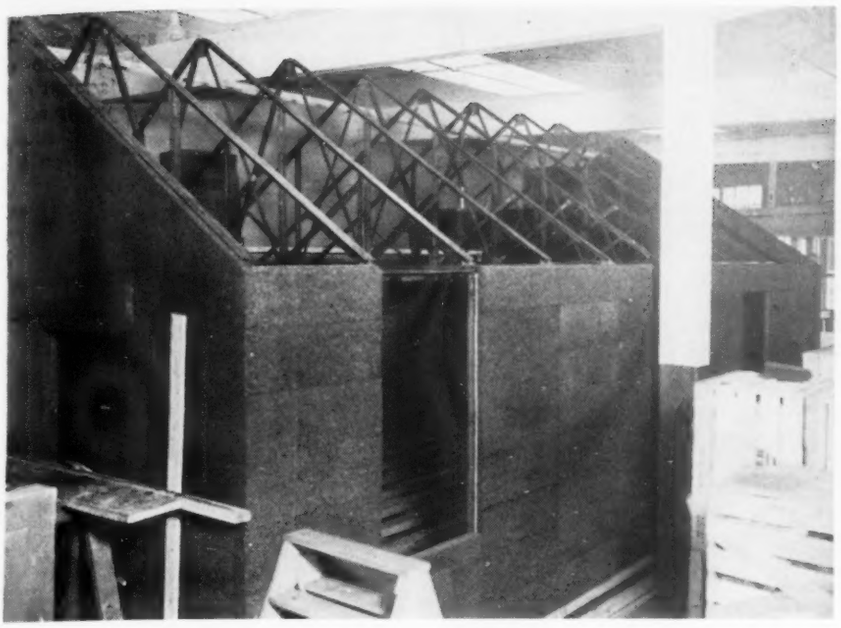
Naturally, an emulsion should have some detergent of cleansing action, but the way to a finer finish and lustre might be made easier by placing somewhere in a system facilities for the removal of metal particles and other abrasives. Some users of grinding machines and grinding compounds have already found it advantageous to have a separate central and return system where the emulsion flows through the grinding machine by gravity and is taken to a point remote from the machine where it remains without excitement for a period of time, thus giving the grindings and abrasives an opportunity to precipitate while the emulsion is not in excitement.

Many other practical applications of cutting oils might be discussed, but the factors, such as speed, pressure, temperature and machinability, must also come under consideration, for these factors must necessarily vary from shop to shop and job to job. Of course, it is of economic importance to the automobile manufacturer that the most serviceable oil be obtained for the least expense, and a change to a maximum use of emulsions will, as was stated before, be a step in this direction. This probably can be done, but the consumer must first be enlightened.

Sees Heat



ELECTRIC EYES NOT COLOR BLIND: The human eye is not sufficiently sensitive to detect the slight gradation in color as a steel bar is heated and goes through a wide range of color from red to white heat. To heat steering draglinks to the exact temperature required for expanding the ends, the Chevrolet Motor Co. plant at Bay City, Mich., uses electric eyes that cut off the current in the electric heaters when the bar attains the precise color indicating the proper temperature for finishing. The illustration shows two draglinks being heated, each directly under one of the electric eyes, which are contained in the vertical cylinders above



Corner view of portable cork and steel dwelling, showing roof trusses and outside cork finish in place. The structure was disassembled and crated before shipment to Nome

Cork and Steel Combined in Portable Houses for Alaska

BY ROBERT C. HILL

ADAPTABILITY of steel and cork insulated residential construction, as developed by Corkanstele division of the Cork Insulation Co. Inc., New York, to unusual conditions was amply demonstrated by an installation recently completed at Nome, Alaska. This contract involved two portable one-story dwellings, each 30 x 18 feet in size, the first structures of this type built in the Pacific Northwest.

Because of the physical handicaps which had to be overcome the accomplishment has attracted no little interest. This type of residence is said to be ideally suited to the climatic extremes of Alaska, and the northern territory is expected to prove a promising field for the extensive use of steel and cork buildings.

The order for the initial pair of houses followed the fire of late September which swept the greater part of Nome. Rush orders for building materials were sent to Seattle for prompt shipment as the last sailings for Norton Sound from this port are in early October.

The Seattle office of Cork Insulation company undertook the job Oct. 1. Detailed plans to meet local conditions were prepared, steel was fabricated, cork board cut and fitted, lumber cut to specifications and the entire shipment packaged and delivered to the steamship terminal on the moring of October 6. The steamer sailed the same day. R. E. Eckberg, vice-president of the Morel Foundry Corp., Seattle, which fabricated the steel, went to Nome to supervise erection. For this work ten days were allowed in the schedule so that the engineer could return to Seattle on the same steamer. He was back in Seattle about Nov. 10.

Preliminary Assembly Made

During the four days in which the materials were prepared, one of the houses was assembled completely in the company's plant, then knocked down and crated. Each piece of material was numbered and so packed that each was available in sequence to avoid delay in erection.

In addition to the time element, other physical conditions confronted the builders. Nome rests on glacial formation which is constantly in motion. For this reason concrete foundations are impracticable. To meet this, timber skids were provided for these two houses, on top of which the steel frame is erected. The main timbers are 6 x 6 inches with cross pieces, 4 x 6 inches. Because of the unstable terrain, brick chimneys are out of the question at Nome. For this reason, the steel and cork houses will have tile chimneys brought through the wall inside an asbestos insulated steel collar.

Because of high winds, often reaching velocity of 70 miles an hour, and extreme snowfalls, design of the dwellings had to provide against these conditions. Ample strength is given; for instance, the roof is calculated to carry a load of 10 feet of wet snow and to withstand the most violent wind storms. Complete insulation is said to assure the maximum of comfort in the extreme sub-Arctic winters. Soft coal is used in stoves for heating and the saving in fuel consumption with insulated construction is estimated at 50 to 65 per cent.

Absorbs Higher Cost

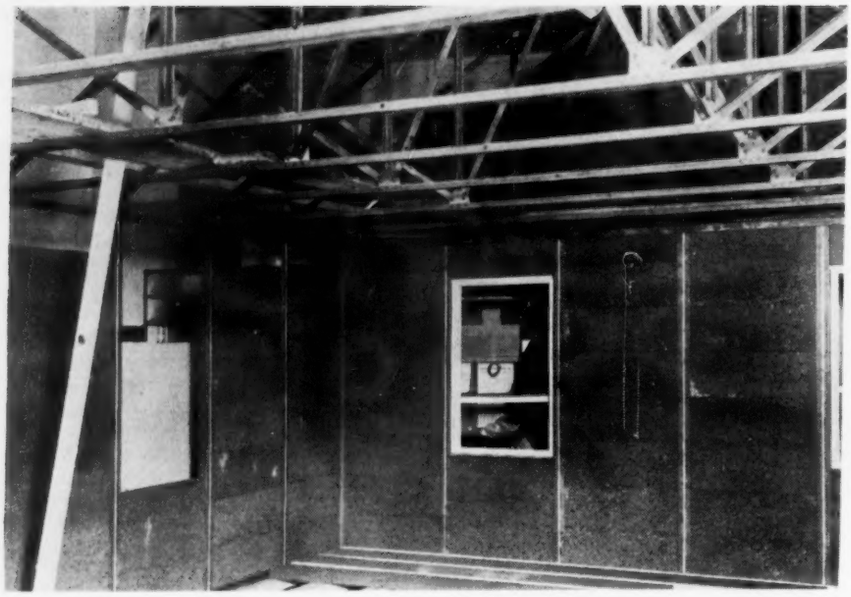
The original cost of this construction is approximately 25 per cent higher than the ordinary frame structure in Alaska but the saving in coal and the other advantages are cited to show that the new type is less expensive in the end. Another claim of the builders, which appeals to many Alaskans, is that steel and cork structures are portable and can be salvaged almost 100 per cent and reassembled. This means much to miners, trappers and others whose interests sometimes take them to new locations. The fireproof feature of cork and steel is a further advantage under conditions such as prevail in the North.

Each of these two houses required 2½ tons of steel and 5500 feet, board measure, of corkboard. The frame is of angle iron, bolted together, with truss angles bolted into gusset plates, these in turn being bolted to the lower cord of the truss. Standard ⅝-inch machine bolts, of needed lengths, were used. The steel members are 1½-inch standard angles, out of stock, and T-bars, erected on 3-foot centers to take standard size sheets of corkboard which measure 12 x 36 inches and 3 inches in thickness. The steel is covered completely by 1½ inches of corkboard on the outside.

The roof is of 1½-inch angle irons with cork laid on top. Between each row of corkboard is laid a wood nailing strip, 1⅝ x 3 inches net. On top of the corkboard is laid a wood sheeting of 1 x 6-inch tongue and grooved stock. Above this is placed a layer of composite roll roofing, fireproof, and securely fastened. Shingles are useless in Nome as high winds rip them off any structure.

The cork insulation is squeeze fitted between the angles and secured at the angle by ⅛-inch wires which run around the angle and through a small metal plate on the outside.

There is no plumbing in these



This illustration is taken from an inside corner looking toward the opposite corner, showing wall angles, roof trusses, wall and gable cork in place, also floor cork started in corner. Note wood nailing strips between sheets of cork

structures. Electric lines can be run inside, if desired, through the cork walls. However in the standard type of construction, the steel frame is embedded in a concrete foundation and all pipes and wiring are run through the corkboard walls, by means of ducts.

This composite design permits any type of exterior and interior finish. Stucco, brick veneer or stone can be used on the outside by applying to the corkboard walls. The interior may be of plaster, veneer panels or other finish, depending upon the builder's requirements.

Temporary Wall Finishes

Because of the advanced season, it was impossible to provide stucco or plaster exterior for the Nome houses. However, the outside of the cork was finished with a coating of asphalt and cement, which seals the crevices and is windproof. On top of this mastic covering aluminum paint was used. For the same reason interior finish of plaster was not provided. For the inside ¼-inch wood panel was forwarded in addition to sufficient material for the interior partitions. Next year, if desired, when weather conditions permit, an exterior of stucco and an inside finish of plaster may be applied. Sheet iron is a popular exterior material for structures in Alaska, as it resists the elements, and this material can be applied to the corkboard as readily as stucco, if preferred.

Wood doors and windows in wooden sashes are part of the Nome specification, although under normal conditions steel doors and window frames are used. Ventilation is provided by adjustable panels in the bottom of the window sash, to be used as required.

Mesh Perforations Designed To Aid Accurate Sizing

Increasing interest is being shown in a new type of perforated metal for screening and sizing bulk materials. The new product is known as Sqround (*scround*) mesh and is fabricated by the Hendrick Mfg. Co., Carbondale, Pa. The mesh combines the large open area or capacity of square mesh with the accuracy of sizing in round perforations, this being accomplished by means of fillets in the corners of the square perforations, which are in a fixed ratio to the size of the hole, the diagonal distance between fillets approximating the diameter of an equivalent round mesh. Thus in a 2½-inch mesh the distance between diagonally opposite fillets is 3 inches, while the diagonal of a 2½-inch square mesh measures 3 17/32 inches.

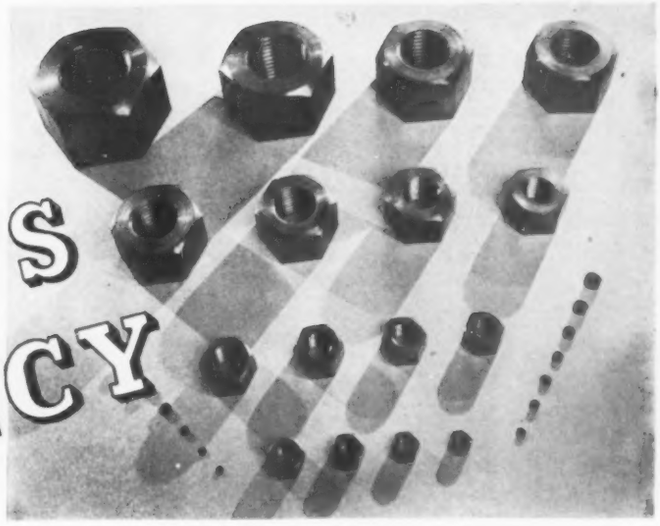
Oversize materials which would pass through a full square hole are prevented from passing through this combination perforation. As a result, it is possible to obtain accuracy of sizing with but little reduction in the open area of the screen. Any size of perforation is available in straight or staggered arrangement, in flat plates or in double corrugated plate.

Welding Exhibit in Museum Of Science and Industry

Announcement is made by O. T. Kreusser, director of the Museum of Science and Industry, Chicago, that complete equipment, including material handling hoist, for a permanent exhibit of industrial welding has been presented to the institution by the Harnischfeger Corp., Milwaukee. The exhibit is of unusual interest because of the increasing use of arc welding in industry. The exhibit itself is an ingenious one, for with the demonstrations carried on behind a special colored glass, visitors are able to see at close range the technique employed in various types of welding without blinding glare.

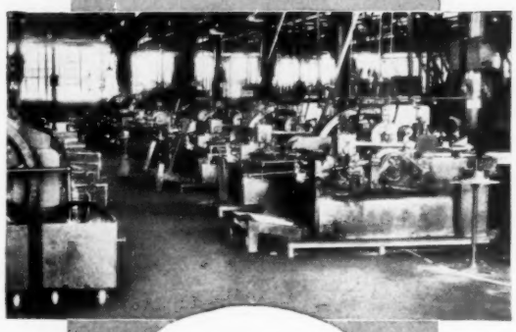
Kitchen Goes Modern

STAINLESS HOT-COLD CABINET FOR THE HOME: This combination of warming closets above and refrigerating space below recently was installed in one of the larger residences of Groton, Mass. Stainless steel of the 18-8 *chrome-nickel Enduro variety, supplied by Republic Steel Corp., Youngstown, O., was used largely in fabrication of this unit, William B. Berry Co., Boston, being the fabricator. Other stainless steel equipment in this same kitchen included sink and drain board*



SUNOCO'S EFFICIENCY

. . . As Shown in the Making of Empire Nuts



THE Coraopolis, Pa., plant of the Russell, Burdsall & Ward Bolt and Nut Company is well known. There are produced the widely used Empire nuts of every size, shape and style . . . nuts noted for their strength, fit and finish.

Machines Produce at Rated Capacity . . . With SUNOCO

In the R. B. & W. machines which cut the spool of steel, cold punch, chamfer, trim and burnish in one operation, a cutting lubricant of dependable performance is essential. This cutting oil must prevent overheating and drawing of the temper of dies, punches and cutters. It is significant that Sunoco Emulsifying Cutting Oil is chosen . . . and that these machines *produce at rated capacity.*

Smooth, Accurate Threads, Too

All day long (and frequently throughout the night) Sunoco does its part in the R. B. & W. nut tapping machines. And smooth, accurate threads are the result.

Aids Tools in Giving Best Service

In the manufacture of nuts, punch, die and tap life is most important. Time lost in resetting must be held to a minimum. The Russell, Burdsall & Ward Bolt and Nut Company find that with Sunoco, they secure long runs between tool settings, tool maintenance is reduced, and greater accuracy with better finish is obtained.

WE suggest a trial of Sunoco in *your* plant — and under your own operating conditions. Your correspondence will have the prompt attention of our cutting oil engineers.

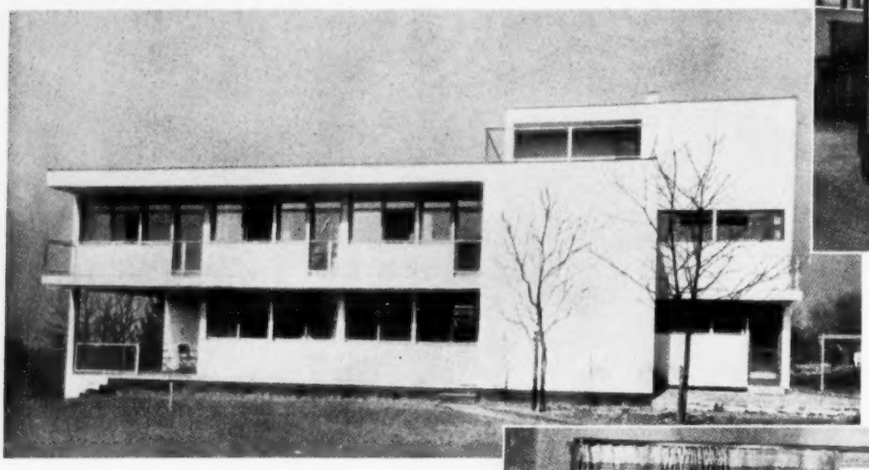
SUN OIL COMPANY
PHILADELPHIA, PA., U. S. A

SUNOCO
EMULSIFYING
CUTTING OIL

German Steel Fabricators Design New Products

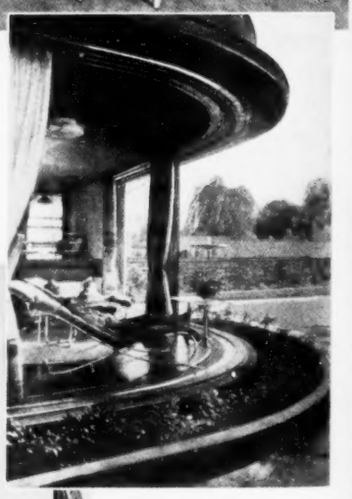
FOR the presentation of illustrations on this page STEEL is indebted to a recent publication, entitled "To Be Healthy Stay Healthy," illustrating the widespread use of steel in the construction and furnishing of residences, and published by the Advisory Board for Steel Distribution, Dusseldorf, Germany.

Architecturally designed steel vestibule (above) for front entrance



STEEL residence designed to admit light and air to all rooms is shown above. A steel window specially designed for ventilation and unobstructed view is shown below

A DOCTOR'S office equipped with steel furniture, particularly a new, modernistic type of steel desk, is shown above, while below is a bedroom with steel bed, closet, table, chairs and bookcase



Suite of rooms (above) with steel doors, sash and furniture

Window arrangement (above) by which the usual barrier between the interior of the residence and the garden may be removed

Yearbook Issue of STEEL
Jan. 7, 1935

What it is—

(1) The Yearbook issue of **STEEL,** published on the first Monday of each year, is a long established institution in the iron, steel and metalworking industries. Through years of development, it has become the widely accepted, authoritative, annual inventory of progress in these allied industries.

It presents statistics of the past year and compares them with corresponding data for previous years. It reviews the current trend of all important markets, interprets the price situation affecting all essential products, and outlines and comments upon the principal current economic and scientific problems of the industries. In brief, the Yearbook not only embraces in a single issue all of the current and past historical information which one could reasonably expect to find in a reference book, but also contains the analyses and interpretation necessary to enable the reader to apply this information to the peculiar requirements of his business today.

What it contains—

(2) The 1935 Yearbook issue, dated January 7, 1935, will contain:

A thorough-going summation of the present status of industry in relation to the government administrations recovery program. This will embrace a series of articles dealing with NRA code administration, the famous Section 7a, open prices versus fixed prices, job insurance, pension plans, confiscatory taxes, etc.

Whither the iron, steel and metalworking industries? A critical study of important economic trends, touching upon the shifting of markets geographically and in relation to products, the effect of continued consolidations and mergers, the influence of railroad rates, etc.

Where does the annual output of finished steel go? The figures for the current year—the 13th annual compilation—may reveal significant realignments in consumption.

The last word on the development of alloy steels. By statistics, text and illustration, **STEEL** will show the truly remarkable progress of these special steels in 1934. Resume of progress in metallurgy, engineering and research in every department from blast furnace, steelworks and rolling mill through to the intricate processes of manufacture and assembly.

List of additions to and modifications in blast furnace, steelworks and rolling mill facilities.

An analysis of the current iron ore situation, with special emphasis upon the problem of confiscatory taxes.

STEEL'S regular feature "The Business Trend," expanded to show by graphic charts the essential steps in the march of business through the year.

Condensed, concise annual reviews of the domestic and foreign iron and steel markets.

STEEL'S "Market History"—Tables of iron and steel prices by months, extending over a period of 35 years. "Windows of Washington", "Mirrors of Motordom," "Making the Most of Methods and Materials," "Progress in Steelmaking," "As the Editor Views the News" and other regular features which make **STEEL** industry's most distinctive business paper.

Where it goes—

(3) Over 10,000 copies will be printed and distributed throughout the world to every branch of industry using or producing steel and iron in any form. The Producer, Fabricator, Manufacturer, Engineer and Banker find this volume of great assistance in checking past performance and laying future plans.

Who reads it—and keeps it—

(4) Many thousand executives — presidents, proprietors, vice presidents, secretaries, treasurers, works and general managers, purchasing agents, engineers and foremen know, read and preserve the Yearbook for the completeness of its information and its continuous reference value.

Why Advertising Value—plus

(5) Because of the admitted value of the Yearbook from the editorial standpoint the advertising it contains is unusually important. It serves to complete the story—is available for reference throughout the year and when properly planned is an important supplement to any yearly campaign.

The Where-To-Buy directory—complete and accurate as to advertisers—supplies information to buyers on thousands of individual products, processes and services.

What kind of copy to use and why—

(6) Copy should be a combination of straight display and catalogue type. The Yearbook supplements the week to week issues, so advertising should be prepared to arrest attention at the first reading and also be sufficiently complete to make it of continued reference value. A campaign of advertising brings out either (A) individual points of a product—one point to an issue—or (B) covers the entire line—one item at a time.

Advertising in the Yearbook should present all the points or all the products. Make it the "Master Advertisement" of the campaign, or if used singly, tell the whole story of your product, process or service.

Significance of Anode and Cathode Efficiencies

BY C. B. YOUNG, Technical Director,
United States Research Corp., Long Island City, N. Y.

ANODE and cathode efficiencies, often reported in the current literature, sometimes fail to give electroplaters the complete picture of their significance. It can be seen readily if the anode and cathode efficiencies are low, more current will have to be used in order to plate out a given amount of material than if efficiencies were 100 per cent, but this does not tell the whole story. This article will attempt to show other effects as the efficiencies vary.

Faraday's law defines the amount of material—metal, for instance—which will be deposited on an electrode provided a certain amount of current is passed through a solution, but it does not state which element or compound will be deposited under a given set of conditions. For instance, it is possible to plate only zinc from a zinc sulphate solution; under different conditions, such as high acid concentration or high current density, a large amount of hydrogen will be evolved along with the zinc. In both cases, however, the amount of material deposited is the same.

How To Figure Efficiencies

As a general rule the plater wishes to obtain the metal; therefore, the current efficiency is figured as the amount of current which is actually used to dissolve or deposit the metal in question. Thus, the cathode efficiency may be stated as the ratio of the amount of metal actually deposited by a given current to the maximum weight of the same metal which could be deposited according to Faraday's law. The anode efficiency is the ratio of the weight of metal dissolved from the anode to the maximum weight which could be dissolved according to Faraday's law.

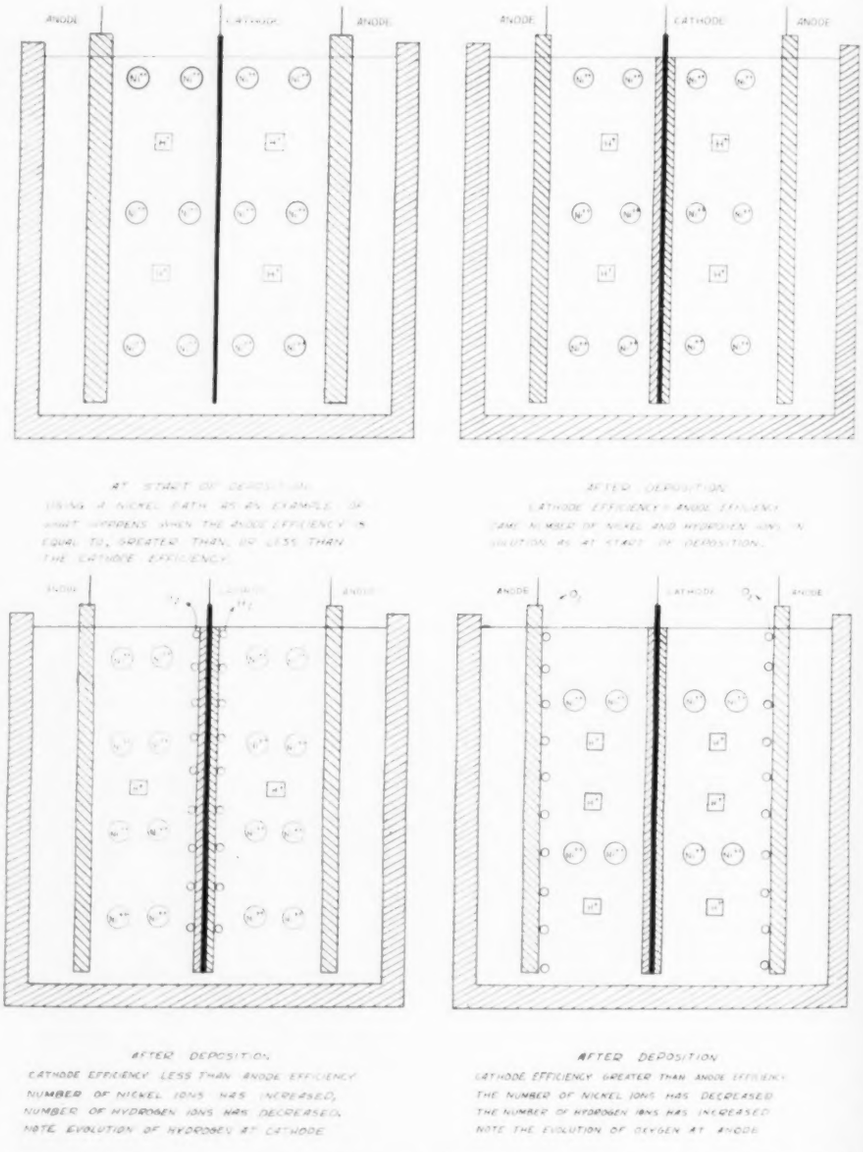
If the anode and cathode efficiencies were 100 per cent, the electrolytes or baths would change little. In this case the hydrogen ion concentration of the solution would remain constant (considering only those changes which take place due to the current and not considering chemical changes, such as carbon dioxide of the air forming carbonates with the solution), the metal ion concentration would remain constant, the anodes always would dissolve uniformly and all the metal dissolved at the anode would be deposited at the cathode.

Unfortunately, the above ideal condition is not the case in practice. Seldom are 100 per cent efficiencies of the anode and cathode approached. Silver, one of the best metals in this respect, gives efficiencies in the neighborhood of 100 per cent, and for this reason it is used as a standard to measure the amount of current which passes through a solution. (Zeitsch, Physikal Chemie 41 302 [1902]).

From experiences in the electroplating room, especially if the metal deposited, zinc for example, is above hydrogen in the electromotive series of elements, it cannot be hoped to obtain efficiencies near 100 per cent. On the other hand, if it is possible to have the anode efficiency equal to the cathode efficiency, even then the solution may change slowly with respect to the metal ion concentration and the hydrogen ion concentration. In the latter case, the only important loss will be the current and in the plating plant this is not a serious handicap. The electroplater need not worry about current consumed, since this is generally a small item compared with the labor, cost of solutions and the like.

In a nickel bath, the determining

(*Please turn to Page* 51)


ANODE
CATHODE
ANODE
AT START OF DEPOSITION
USING A NICKEL BATH AS AN EXAMPLE, OF WHAT HAPPENS WHEN THE ANODE EFFICIENCY IS EQUAL TO, GREATER THAN, OR LESS THAN THE CATHODE EFFICIENCY
AFTER DEPOSITION
CATHODE EFFICIENCY LESS THAN ANODE EFFICIENCY
NUMBER OF NICKEL IONS HAS INCREASED,
NUMBER OF HYDROGEN IONS HAS DECREASED.
NOTE EVOLUTION OF HYDROGEN AT CATHODE
AFTER DEPOSITION
CATHODE EFFICIENCY GREATER THAN ANODE EFFICIENCY
THE NUMBER OF NICKEL IONS HAS DECREASED
THE NUMBER OF HYDROGEN IONS HAS INCREASED
NOTE THE EVOLUTION OF OXYGEN AT ANODE

Sketches showing effects of anode and cathode efficiencies on hydrogen ion and metal ion concentration in plating baths

Many Industrial Uses for New Electric Heat Gun

Many places can be found in industry where quick, concentrated heat is required. It may be a case of frozen water pipes, frozen valves, cold grease boxes, or it may be a quick touch-up job of painting. Usually it is an emergency job where ordinarily neither constant nor intermittent heat is necessary. For just such jobs a new electric heat gun has been developed. Portable and easy to carry from job to job, this new electric tool develops instant, concentrated heat in volume.

In construction, the gun is simple. A small fan drives a large quantity of air past a heating element which is located in the nose of the gun. The element heats practically instantaneously and provides air at a temperature of 400 degrees Fahr. at the nozzle. To enable the operator to use the heated air exactly where it is required, various types of nozzle attachments have been developed. This makes it possible to reach those places that may be obstructed in such a way that the gun itself cannot be placed close enough to provide the required amount of heat.

Although the gun was introduced primarily for automotive use, it lends itself readily to a wide variety of industrial applications, since it allows an intense concentration of heat on a given spot without fire hazard.

S S S

Hide Shaving Machine Has Precision Adjustment

As a result of the nonuniform thickness of animal hides, glove manufacturers have found it necessary to "shave" the tanned hides to uniform thickness. This operation consists of passing the hide under a rapidly revolving abrasive roll. In this work, extreme accuracy is essential, and the development of a machine capable of performing this grinding operation successfully called for special precautions.

Such a machine has been built by the Curtin-Herbert Co.,; it embodies a roll 50 inches long, directly connected to a 5-horsepower motor. The roll is covered with fine emery dust or extra fine sandpaper and revolves at 1155 revolutions per minute. To insure freedom from friction and to aid accuracy of adjustment, the roll is mounted at both ends on tapered roller bearings supplied by Timken Roller Bearing Co., Canton, O. Adjustment of the grinding roll is so delicate, it is said, that a piece of newspaper or a magazine page may be passed under the roll and only the print will be removed, without cutting or tearing the paper.

S S S

Good Lighting Is Found To Increase Production

One of the most conclusive proofs that good lighting pays its cost is furnished by a national piston company. This plant was inadequately lighted and the local power company induced it to make a lighting test. The president reports that at the beginning of the test the plant was running at about 70 per cent capacity with a lighting intensity of 1.2 foot-candles. In one department the

Smasher

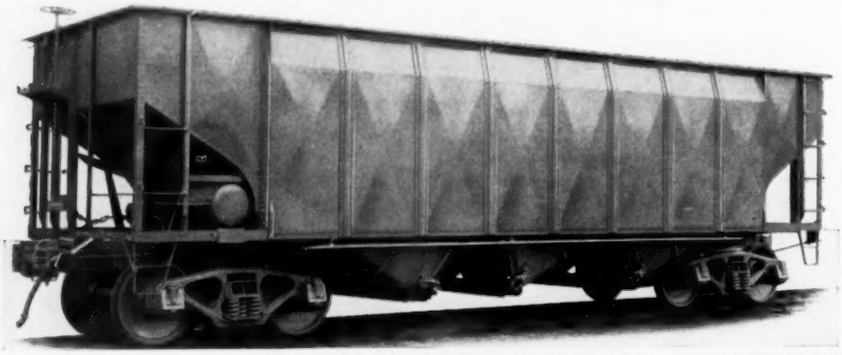
BOTTLE-BREAKING MACHINE INSTALLED AT WALDORF: Oscar of the Waldorf-Astoria, New York, presides at the christening of a new bottle-breaking machine, installed as a result of a treasury department ruling against re-use of liquor bottles. The machine, built by Halbert P. Hill & Associates Inc., New York, weighs about 100 pounds, principally steel, is electrically operated by ½-horsepower motor, and can break bottles of any size from a champagne magnum to a nip at the rate of 35 a minute. Broken glass or "cullet" is deposited in a bag attached to the outlet of the machine, pieces being about ½-inch or smaller in size, free from sharp or cutting edges. Bottles are broken by the action of small steel plate hammers attached to a shaft through links. In a busy season, the Waldorf will destroy about 2000 liquor bottles per week, it is estimated

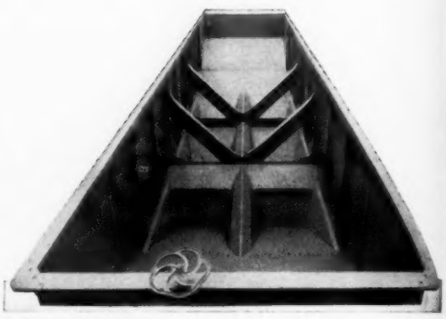
USS COR-TEN

THE NEW "TRANSPORTATION" STEEL

For Lighter Weight Construction

U S S COR-TEN is a low chromium copper silicon steel of high tensile strength and with an atmospheric corrosion resistance conservatively estimated at from four to six times that of ordinary open hearth steels. U S S COR-TEN insures lighter and stronger construction, with safety and durability.





NEW LIGHT WEIGHT HOPPER CAR — BUILT OF U S S COR-TEN STEEL
Capacity 138,000 — Load Limit 139,000 — Light Weight 30,000

A major cost of railroad operations is in moving dead weight and empty cars. U S S COR-TEN is a practical solution to this problem of excessive weight. *Costly dead weight is converted into increased capacity for pay load at no increase in operating costs.* This is a factor for added profits. As a material for weight-saving railway equipment, U S S COR-TEN Steel offers unique possibilities and wide adaptability. A striking example of this fact is in the hopper car illustrated, designed and constructed by one of the leading car building companies. This car weighs only 15 tons and yet is capable of carrying 69½ tons—a ratio of *pay load* to dead weight of 4.63 to 1.

Address the Following Manufacturing Companies

AMERICAN SHEET AND TIN PLATE COMPANY, *Pittsburgh* **TENNESSEE COAL, IRON & RAILROAD COMPANY**, *Birmingham*
AMERICAN STEEL & WIRE COMPANY, *Chicago* **COLUMBIA STEEL COMPANY**, *San Francisco*
CARNEGIE STEEL COMPANY, *Pittsburgh* **ILLINOIS STEEL COMPANY**, *Chicago* **NATIONAL TUBE COMPANY**, *Pittsburgh*

Pacific Coast Distributors—COLUMBIA STEEL COMPANY, San Francisco, Calif. *Export Distributors*—UNITED STATES STEEL PRODUCTS COMPANY, New York, N.Y.

United States Steel Corporation Subsidiaries

USS HIGH-TENSILE STEELS

Supplied in Plates, Shapes and Bars—also Strips, Sheets, Light Plates, Rods, Wire and Wire Products, Pipe and Tubular Products

IN addition to USS COR-TEN described on the opposite page, investigate also the cost-saving advantages of USS MAN-TEN and USS SIL-TEN in passenger and freight cars of lighter weight, and where great corrosion resistance is not a factor.

These grades of USS High Tensile Steel have been carefully developed to meet a multiplicity of transportation requirements, particularly in the construction of cars, rapid-transit equipment, trucks and buses.

The range of rolled sections and shapes of USS High Tensile Steels is being extended as rapidly as additional engineering and commercial requirements are indicated. Equipment designers are using these moderate-cost alloy steels in such a manner as to realize every advantage of weight-reduction, strength, durability, efficient and economical operation.

Not only the bodies of rolling stock but also the underframes and truck parts may be substantially lightened through new design. Increased savings in power, and increased revenue through greater carrying capacity, begin with the use of new light-weight equipment. The investment in such improved facilities will rapidly pay for itself and earn profits.

	ORDINARY OPEN HEARTH	USS COR-TEN	USS MAN-TEN	USS SIL-TEN
YIELD POINT (Lb. / Sq. In.)	25 to 35,000	50 to 60,000	55 to 65,000	45,000
TENSILE STRENGTH (Lb. / Sq. In.)	35 to 50,000	65 to 75,000	80 to 90,000	80 to 95,000
ELONGATION (% in 2 In.)	34 to 25	27 to 22	25 to 20	23 to 18
ALL THESE STEELS ARE READILY WELDED AND FABRICATED				

NOTE: If Steels of still higher tensile strength and corrosion resistance are required, we recommend our USS STAINLESS and Heat Resisting Steels—the practical maximum of these qualities being reached in USS 18-8.

USS MAN-TEN

—a lower priced medium Manganese Steel of impressive strength, for applications where corrosion-resistance of USS COR-TEN is not required.

USS SIL-TEN

—a strong structural Silicon Steel of still lower price, for applications where neither the atmospheric corrosion resistance of USS COR-TEN, nor the great strength of USS MAN-TEN is required.

Address the Manufacturing Companies shown on Opposite Page

United States Steel Corporation Subsidiaries

For GREATER EFFICIENCY USS

lighting was stepped up to 6.5 foot-candles and production increased 13 cent. Then it was further increased to 9.0 foot-candles and an additional 4.9 per cent increase in productivity was obtained. Finally, the lighting was increased to 14 foot-candles and production jumped another 6.9 per cent. In all, the lighting of 14 foot-candles increased production 25.8 per cent over the old installation.

s s s

Metal Surface Graining Is Aided by New Tool

The regular graining roll, used to apply the wood grain effect to metal surfaces, will not roll itself into sharp corners and it is usually necessary to finish the corner graining by hand. A tool designed to apply graining to a surface between two projections has been patented recently. With this special tool, which is simply an arc cut from a large roll so that the length of the arc is just about equal to the distance to be grained, the grain is picked up off a board as usual, and one end of the tool is pressed into one corner and the tool is rolled across the piece, ending up in the opposite corner.

s s s

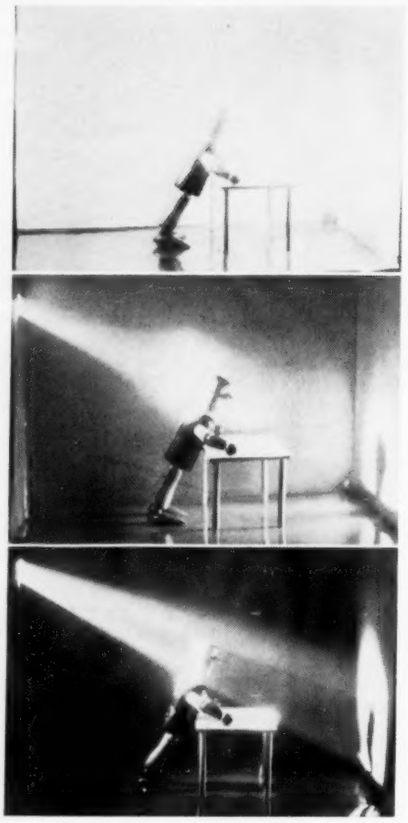
Light Casting Alloy Given Addition of Cerium

An English company recently has introduced an alloy of low specific gravity and high tensile strength and possessing good casting properties. It has the following analysis: Copper, 2.5 per cent; nickel, 1.5 per cent; magnesium, 0.8 per cent; iron, 1.2 per cent; silicon, 1.2 per cent; cerium, 0.15 per cent; and aluminum, the remainder. It is said that cerium has a refining action on the macrostructure, allows beneficial mechanical effects of a high iron content to be obtained by suppressing the embrittling iron-aluminum constituent, and provides a metal which runs easily.

s s s

Encounter Difficulties in Enameling Stainless Steel

A leading manufacturer of porcelain enameled steel signs has recently been experimenting with the use of enameled stainless steel. The prospective installation of such a product was planned for a subway roof in one of the cities of the East. However, for the present, a cost factor plus enameling difficulties with stainless steel have precluded its wide adoption.



Cameragraphs Tell Story of Light, Sight and Paint

HERE are three so-called robot tests which show graphically the differences in value of paint colors for better vision, differences which may be translated into definite value in plant practice and maintenance, both as regards lighting and painting.

Conducted in laboratories of the Sherwin-Williams Co., New York, these tests tell an interesting story in three illustrations. By using the same small room and by keeping the light constant, the camera has been made to register the eye value of the light diffused by any color desired to be tested, when applied to walls and ceilings.

The first, at the top, is a white or egg-shell finish, having unusually high light reflective rating—87 per cent. Diffusion of the light is so nearly complete that little contrast is observable between the light source and the white wall.

In the center illustration a high-grade polished aluminum bronze wall finish has been used. Rather high specular reflective power is observable in the sharpness of the image of both the light source and reflected table top on the walls, as well as light carried back across the floor. General light diffusion value, however, ranks with a silver gray of about 50 per cent.

The lower view shows gloss black walls, and is interesting in that it shows the spotlight effect produced by the same light which so completely illuminated the white room. Black and the majority of dingy smoke-blackened walls diffuse practically no light; glare is pronounced, the amount of current needed for adequate working light increased out of all reason and the danger of accident and spoilage an unjustifiable overhead.

s s s

Metallic Packing Stops Hydraulic Cylinder Leaks

A water pressure of 1500 pounds per square inch was used by a large concern on a hydraulic production butt welder. The leather cups which were used as a packing on the pistons were a constant source of trouble for they wore out rapidly and often broke after only a few hours of operation, necessitating frequent shutdowns of the welder. A metallic packing was then designed which stood up better in service.

The metallic packing consists of two piston head halves with a slide fit on the stud of the piston and a loose fit in the cylinder. A plug in one of the heads prevents any water from passing along the piston rod stud. The piston halves are beveled to make room for the piston rings and effect their expansion when pressure is applied to either end of the piston head. The two piston rings are fitted closely into the cylinder which must have a perfectly round and smooth bore. Each ring is slotted once with a 1/32-inch thick saw. When assembling, care must be taken that the slots are 180 degrees apart. To prevent wandering of the rings and meeting of the slots, the rings can be secured by small pins.

In operation, no trouble was encountered by excessive friction or wedging of the rings. Their narrowness—they were ½-inch wide on a 4-inch diameter piston—permitted them to wear in rapidly and keep a valve-seat-like fit in the cylinder; scarcely any leak could be observed out of the drain pipe when full pressure was applied.

s s s

Gray Iron More Important As Structural Material

Improvements which have been effected in the metallurgy of gray iron have raised the standards of the entire industry and caused a changed conception of that material for structural applications. Gray iron has become an important engineering material because of its vastly improved physical properties and because when melting in an electric furnace, it is possible to control and reproduce these properties at will, thus en-

abling this new material to fill economically an important place in engineering design and service.

\$ \$ \$

Failure To Provide Heat Often Proves Expensive

Many plants have some room or equipment which requires more heat than is normally supplied for general heating requirements during the fall and winter months. It may be in a plant office, a yard office, or a crane cab where people work. It may be that additional heat is required to prevent sprinkler valves, pumps, or other equipment from freezing. Electric heaters provide a simple and economical solution to this problem. Providing sufficient heat for such isolated places often is neglected, sometimes at great cost. For example, one plant froze two large expensive valves and the repair cost was \$75. Installation of a 1000-watt heater would have prevented this trouble. With automatic control, such a heater would be "on" and consuming current only about 50 per cent of the time.

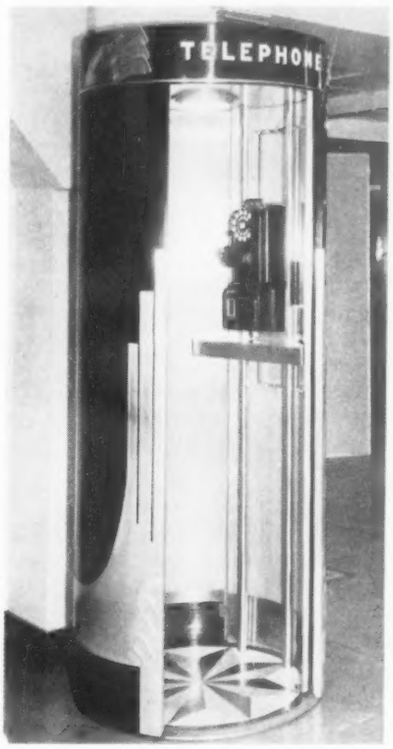
Circular Telephone Booth of Sheet Steel Has Utility and Improved Appearance

AN ALL-STEEL spot-welded circular sliding door telephone booth with automatic ventilation, soundproof and flexible as to fabrication and finish, has been placed in production by the Sherron Metallic Corp., Brooklyn, N. Y. The booth, shown in the accompanying illustration, while produced on a fixed basic design, allows for a variety of finishes, metal trim of contrasting materials, in harmony with the interior of the room. It may be produced as inexpensively as a wooden booth or as elaborate as the architect or buyer may specify.

Simplicity Is Keynote

Simplicity and flexibility in fabrication with a minimum of jigs and machinery features production. The booth is 84 inches high, 33 inches diameter with a door opening 76 inches high and 21 inches wide. Only six sheets are used, 18-gage furniture finished, in a standard booth, with a lighter gage for special steels of a higher tensile strength. For the cylinder, four sheets are formed by a bending roll into a cylinder, two for the outside wall and two for the inside, there being a 1-inch space between the shells for sound insulating material. In the rear of the cylinder, where the edges of the bent sheets meet, a steel angle reinforces the seam which is spot welded the entire height of the unit. The sliding door is also of two sheets with 1-inch space between the walls for insulation. The window comprises two flat panes of glass, meeting at the center of the window in a steel angle frame. Convex shaped glass is not used, since in event of breakage in shipment or in use, replacement would be costly, whereas flat glass is readily available and is less costly.

The interior of the cylinder is reinforced at top and base with angles, spot welded to the walls, the top reinforcing angle being several inches below the edge to allow installation of the circular ceiling which is also of sheet steel. The steel door suspended from a small circular stainless steel track operates on two small bronze ball-bearing wheels, and swings to the right of the user of the telephone after he has entered the booth. Operation is noiseless. Closing the door automatically starts a small concealed fan, there being several spaces in the ceiling for air exhaust. These exhaust outlets, however, are hidden. A specially designed light in the ceiling throws illumination directly on the telephone instrument. The lighting fixture frame is counterbalanced in such a manner that it automatically returns to the horizontal position, even though it should be left unlocked after replacing the lamp. The light and the centrifugal fan are operated automatically by the opening and closing of the door, through a concealed switch. Air in the booth is changed every minute and the fan is so arranged as to prevent uncomfortable drafts.



This attractive cylindrical telephone booth is built at low cost and harmonizes with modern trends in interior decorating

Rubber composition is used for the flooring, with an abrasive material for the floor tread. Noncorrosive steel strips welded to the base of the interior and outside walls serve as kick-plates. The interior shell of the unit is removable, allowing repairs to the outside wall in case of dents which may be pressed out to the original curve. Connecting the two outside sheets above the door is a circular steel sign, "Telephone," spot-welded to the top of the cylinder. This sign may be of several finishes or types of steel, lighted or unlighted. While the lower cost booth is plain lacquer finished both inside and out, a wide range of decorative metal trims is possible, these also being spot welded to the walls as desired.

Height of Phone Adjustable

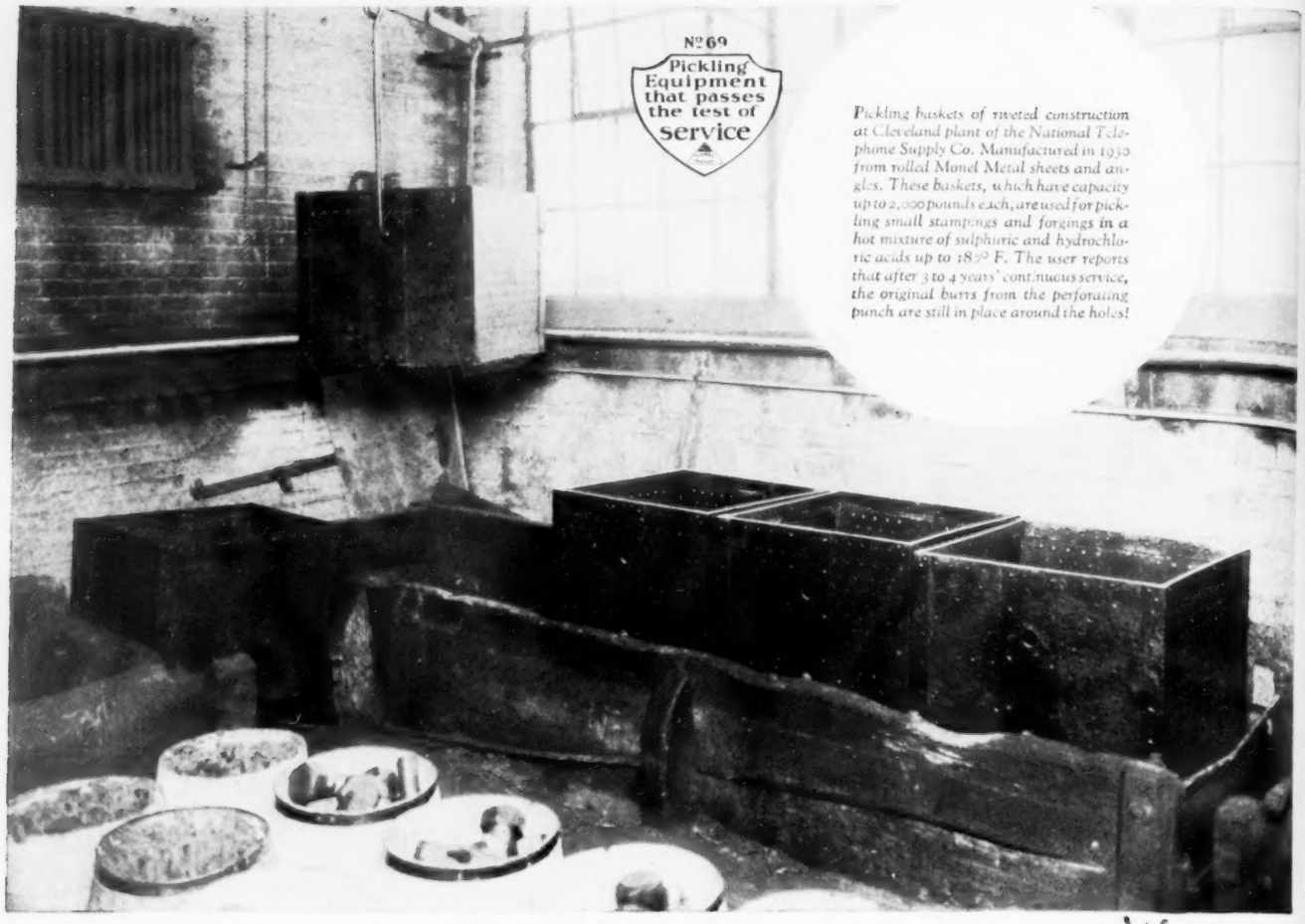
Major tools required in fabrication include a bending roll, brake press, shear and spot welder. The telephone instrument is adjustable as to height, being attached to two light perpendicular tubular steel standards, the door in opening sliding behind the uprights and instrument. The telephone may be set in the field for sitting and standing positions.

A potential annual market for 5000 tons of steel, mostly sheets, is estimated by the manufacturers of this new unit. Weight of the standard all-steel booth approximates 450 pounds, about the same as the wood unit.

The soundproof circular design eliminates contiguous walls, assuring privacy while conversing. The booth is fireproof and easily cleaned.

There is said to be actually more room in the circular booth than in the standard square-type wooden unit.

Through the tubular metal standards lead-in wires may pass into the booth from either the top or bottom of the unit. James W. Hunter, Pratt Polytechnic institute, Brooklyn, collaborated with the manufacturer in the design of the booth which is protected by patents in the United States and abroad.



Pickling baskets of riveted construction at Cleveland plant of the National Telephone Supply Co. Manufactured in 1930 from rolled Monel Metal sheets and angles. These baskets, which have capacity up to 2,000 pounds each, are used for pickling small stampings and forgings in a hot mixture of sulphuric and hydrochloric acids up to 185° F. The user reports that after 3 to 4 years' continuous service, the original burrs from the perforating punch are still in place around the holes!

Less Cussing...

Machinists, Heat Treaters and Enamellers turn out better work when the pickling room is equipped with Monel Metal

TAKE a forging that's all covered with gritty scale; or a casting with silica sand embedded in its surface from the mold. You know what that does to a machine tool. And what it does to the disposition of the machine operator. Also, how it affects your toolroom boss. And, incidentally, the manager who's watching costs!

Or take a part that balks every attempt of a heat treater to get even penetration...no matter how carefully he regulates his fuel or what strange mixtures he stirs into his quenching bath. Maybe forging scale or foreign deposits can't play hob with that situation.

And as for enamelling a surface which isn't cleaned right down to the quick...well, you know *that* simply can't be done.

Clean pickling is the answer in all these shops. And calls (particularly where gritty, silica scale is to be cleaned) for pickling equipment that isn't quickly eaten away—*even in a bath of hydrofluoric acid.*

Monel Metal pickling equipment saves a heap of grief, a heap of "cussing". It cuts costs because it is strong enough and *resistant* enough to stand up well under highly corrosive conditions. Which simply means that the Monel Metal itself isn't being eaten away and isn't weakening the bath unduly. Hence, repairs are a rarity and replacements few and far between.

Why not get detailed facts on Monel Metal performance in the particular pickling job that you have in mind? We have the dope waiting for you. Write.

MONEL METAL TIE RODS
make good wooden tanks
LAST LONGER

•

THE INTERNATIONAL NICKEL COMPANY, INC.
67 WALL STREET NEW YORK, N.Y.

Monel Metal

Monel Metal is a registered trademark applied to an alloy containing approximately two-thirds Nickel and one-third copper. Monel Metal is mined, smelted, refined, rolled and marketed solely by International Nickel.

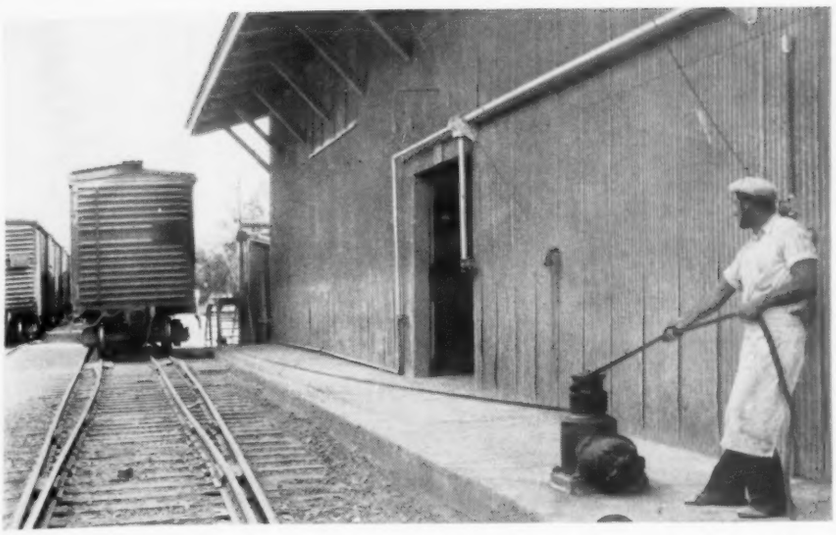


Photo courtesy Link-Belt Co., Chicago

Rolled, forged and cast steel, as well as cast iron and some nonferrous materials, are required in construction of car spotters, widely used for moving heavy loads short distances

LARGE USES OF STEEL IN SMALL WAYS

274th Article ◆ Car Spotters

TAKING up where the locomotive leaves off, car spotters perform an important service in many industries, not only in locating freight cars at desired points for loading or unloading but also in a variety of other ways. Grain elevators were among the earliest users of this equipment, but the market today is broad, including coaling stations, retail coal yards, cement mills, warehouses and practically all types of manufacturing plants where railroad cars are employed in the handling of freight.

By its speed of operation, a car spotter saves time and labor compared with the use of pinch bars, while at times it is more convenient and less costly than maintaining a yard engine. For pulling a load around corners or other obstructions a suitable sheave system may be used. In addition to its principal forte as a freight car mover, the spotter finds service in pulling trucks of lumber into and out of dry kiln, moving cars into and out of core ovens, warping vessels through draw bridges and along docks, and in dragging heavy material along the ground in shipyards, stone quarries, etc.

Car pullers or spotters date back about 50 years, some of the earliest types consisting simply of a horizontal drum and reduction gear that was belt driven from a lineshaft. Later the individual electric motor as a power unit became popular and a vertical capstan replaced the horizontal drum. One of the latest types, shown in the accompanying illustration, combines the capstan and motor into one unit, this built-in feature eliminating the necessity for employing a separate motor base plate.

How Device Is Operated

The machine is bolted to a stable foundation, preferably a concrete base, and located as near to the siding as the surrounding conditions and railway clearances permit, in order to obtain the maximum effective pull at the car. With the rope attached to the car or load, three or four turns of the rope are wrapped loosely around the capstan with the rope from the car always forming the bottom loop. After the motor has been started, the attendant pulls on the end of the rope sufficiently to give the necessary friction between the capstan and the various turns, thereby causing the load to be moved.

Manufacture of car spotters involves the use of a fairly substantial tonnage of rolled, forged and cast steel, as well as cast iron. Annual consumption of these materials is estimated at around 250 tons. Certain motor parts and the capstan shaft bushing comprise the principal uses for nonferrous metals in this equipment. The spotter illustrated has a capstan that is made of semi-steel except when wire rope is employed, in which case the capstan is cast steel. The motor shaft extends into the one-piece, cast iron housing, which contains all the gears. The latter include a forged steel worm, mounted in ball bearings, as well as a steel helical-gear reduction at the motor.

The spotters are made in two sizes. One size is capable of pulling one to three cars, or a gross load of 165 tons, the other from three to six cars, or a gross load of 335 tons, depending on conditions of track, curvature or grade. Weight of the equipment ranges from 750 to 1750 pounds.

Sees Beneficial Use of Tin Compounds in Lubricants

A valuable property of tin compounds is described by Dr. E. W. J. Mardles in a publication just issued by the International Tin Research and Development council.

The deterioration of oils used for engine lubrication is due mainly to oxidation, which causes the formation of sludge, and is accelerated by copper, iron, and certain other metals. Tin and its compounds, on the other hand, are reported to be effective in inhibiting sludge formation. A series of graphs shows how the addition of such compounds as tin oleate or tin tetraphenyl to the oil reduces the amount of oxidation and the viscosity rise on prolonged heating.

Copies of this publication may be obtained on application to the Council, L. J. Tavener, United States representative, 149 Broadway, New York.

Strip Variations Listed

Standard permissible variations or tolerances in the thickness, width, length and camber of hot-rolled strip steel have been issued in tabular form by the Association of American Steel Manufacturers technical committees, headquarters 616 Investment building, Pittsburgh. Variations from thickness, for example, range from 0.003 to 0.009-inch, depending upon width and specified thickness. Strip may be thicker at the center than at the edge by amounts ranging from 0.002-inch to 0.006-inch, depending upon specified width.

FOUR YEARS in any Goodrich

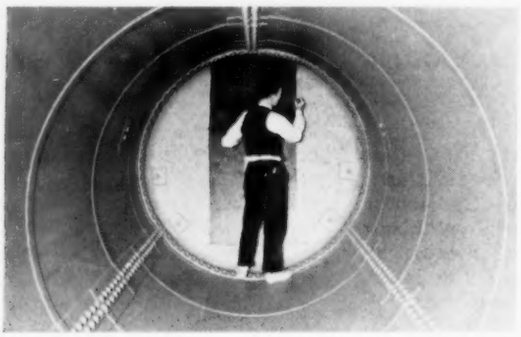
IF acid leakage is one of your worries, listen to this —in the last four years Goodrich Triflex tanks have been installed in plants all over the country, and not one has ever sprung a leak. In every case costs have been lowered, and in most cases the tanks have saved enough in a year to repay their entire investment.

No other tank lining ever developed can even approach such a record of trouble-free service. Goodrich Triflex assures it because of this unique construction:

1 A layer of hard rubber vulcanized between two layers of soft rubber. The hard rubber resists acids and oxidation, and is made with expansion joints which, aided by the soft rubber layers, take up all strains caused by expansion and contraction.

Where service is not severe, a single layer of rubber may be used. Because of long experience, Goodrich engineers know the exact rubber compound to use for the acid you employ, to avoid contamination and to assure maximum life for the tank lining.

2 The inner layer of soft rubber is bonded to the steel tank by the Vulcalock process, assuring a permanent bond because it gives an adhesion of 500 to 700 lbs. per square inch.



● *Applying Triflex lining inside a steel railroad tank car. When lined by the exclusive Goodrich Vulcalock process, an adhesion of 500 to 700 lbs. per sq. in. is assured between rubber and metal.*

● *Vulcalock pressure and storage tank installation for handling hydrochloric acid. From the Vulcalock-lined tank car, acid is discharged through Goodrich acid hose into the storage tank, which is also rubber lined.*

GOODRICH MECHANICAL RUBBER GOODS INCLUDE:
Rubber Lining for Plating, Pickling and Storage Tanks, Tank Cars, Pipe and Valves...Conveyor, Elevator and Transmission Belting... Acid, Air, Steam, Water and Suction Hose... Hard Rubber Goods . . . Packing . . . Molded Rubber Products . . . . and a Complete Line of Miscellaneous Rubber Items.

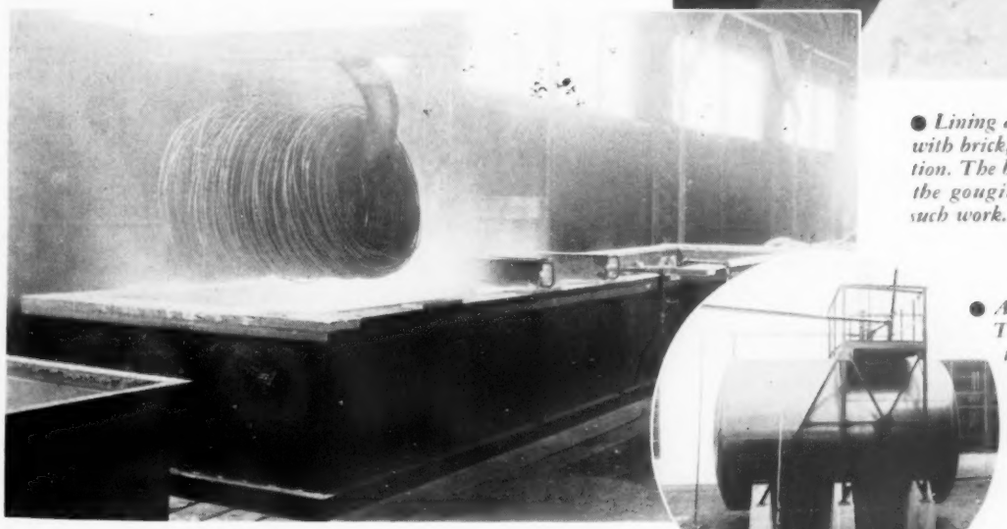
Goodrich

without a leak TRIFLEX Tank

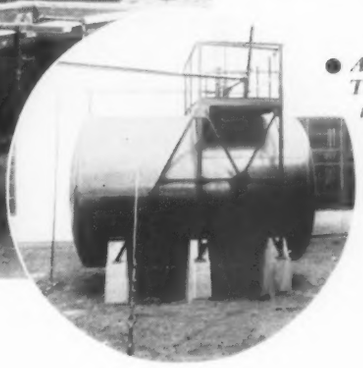
❸ Linings subject to impact and heat as in pickling, are protected by a sheathing of Vitrobond and brick with rubber expansion joints in the brick wall.

Maintenance of acid tanks is a definite expense when other types of lining are employed. Transfer it to net profit by the use of the Vulcalock lining process. By working with engineers of many plants on the problems of acid handling, Goodrich engineers have accumulated a fund of valuable data which they will be glad to make available to you without obligation, for the reduction of your costs. The B. F. Goodrich Company, Mechanical Rubber Goods Division, Akron, Ohio. (In Canada: Canadian Goodrich Co., Ltd, Kitchener, Ont.)

● *Lining a Goodrich rubber-lined tank with brick, for use in a pickling operation. The brick protects the rubber from the gouging and impact common in such work.*



● *Brick-sheathed, Triflex-lined, Vulcalock tanks in the modern plant of a large wire manufacturer.*

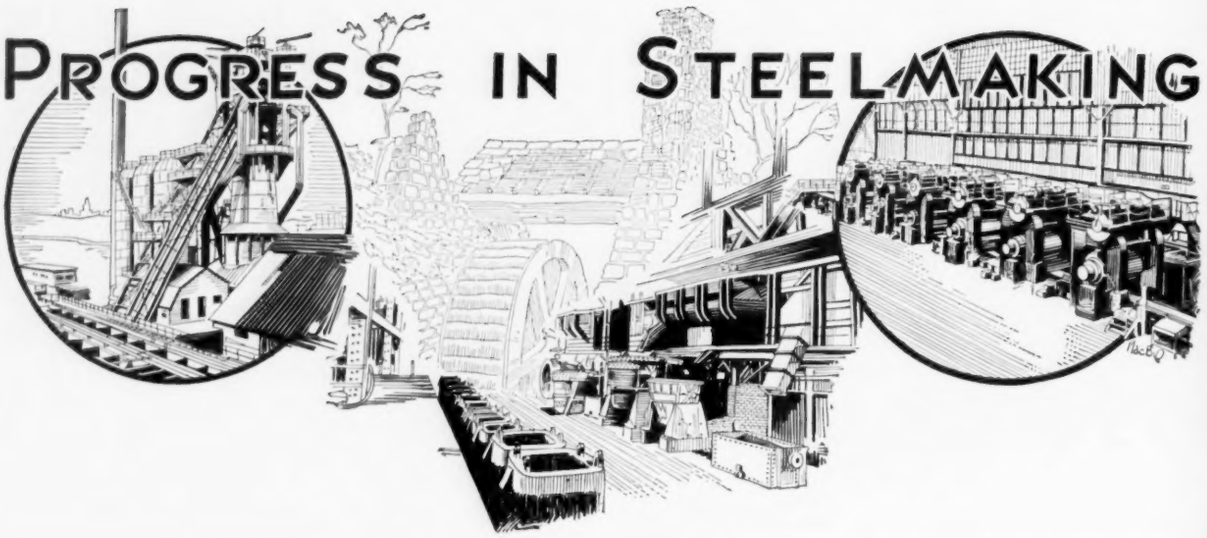


● *A 100% Vulcalock installation. The steel storage and pressure tank, steel pipe and fittings, valves—all are Goodrich lined. Hydrochloric acid is the product handled.*

Rubber Lining

ALL *products problems* IN RUBBER

PROGRESS IN STEELMAKING



HIGH temperature insulation for open-hearth furnace walls is being marketed with the claim that fuel savings will range from 10 to 20 per cent and that refractory life in most instances is benefited, because of a reduction in the velocity of gases passing through the furnace.

♦ ♦ ♦

CAMPAIGN IS EXTENDED

Steel guide shoes serving a seamless tube mill in this country and containing nickel and chromium, lasted for a rolling campaign of about five hours or 580 passes. Recently these guides were replaced with shoes containing chromium and molybdenum and in excess of 10,000 passes now are being obtained at a decided saving in cost because of the elimination of shutdowns.

♦ ♦ ♦

REDUCES UNLOADING COST

Use of strip for bundling steel commodities has reduced the cost of unloading the stock at destination. One particular car of steel shafting, was unloaded in 17 minutes compared to the former handling time of 7 hours at a plant in New York. This was made possible because the shafting was held secure in bundles by strip steel strapping, thus permitting quick removal by crane to storage racks.

♦ ♦ ♦

FURNACE IS TOP-CHARGED

One of the features of a direct-arc electric furnace is a swing-aside roof. The latter is supported on a heavy lifting cylinder which is stationary and separate from the furnace shell. The movement, which elevates the roof and swings it aside, is produced by a ram from a stationary cylinder. A motor-driven pump supplies the necessary oil pressure for operating the lifting mechanism. Once the roof is swung aside, the charge may be placed in the furnace by means of a drop-bottom bucket.

♦ ♦ ♦

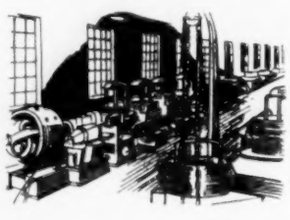
HOW LEAKS ARE REPAIRED

Leaks in acid lines around pickling departments may be repaired by a simple means. The use of soft rubber, asbestos, soft lead or rope asbestos treated with sodium silicate no longer is necessary. If a leak develops on a 3-inch line, particularly if the line is of welded construction, a 6-inch length of 4-inch pipe is sawed in half lengthwise. The interior surface of each half then is coated with acid-proof cement to a depth of about ⅜-inch. The cement should be of the consistency of putty. The two split sections are placed around the leak and are held in place by clamps ¼ x 1¼ inches. Permanent repairs can be made within 15 minutes by this arrangement.

♦ ♦ ♦

DIE NIB IS WATER-COOLED

Cool dies show a marked increase in life and provide a better finished wire due to a longer lasting drawing



surface. A water-cooled device recently placed on the market allows the nib itself to be cooled. The nib, which is supported on both ends by hardened steel plugs is lapped to a master gage at both ends so that the nib and plugs are water tight. Cooling water flows into the die holder, circulates in a chamber and completely envelops the nib. Cracks perpendicular to the longitudinal axis of the nib do not occur inasmuch as the plugs keep the nib in compression and exert sufficient force to counteract any bursting stresses. Tests disclose that bare nibs used in this type die holder remain in service in many cases twice as long as alloy steel dies set in casings. In some cases the tonnage of wire drawn was tripled.

♦ ♦ ♦

ALL SPACES ARE PACKED

Lubricating the hemp core of wire rope with a lubricant of heavy consistency even when heated above 200 degrees Fahr., is being accomplished by a producer by a recently devised machine which feeds it under pressure to the wires as they are being brought together. The wires actually are squeezed together through a solid mass of lubricant, thereby completely packing all the spaces; the excess on the outside then is wiped off.

♦ ♦ ♦

SLAG NO LONGER WASTED

Basic open-hearth slag no longer is considered a waste product suitable only for the slag dump. Large quantities now are used for fluxing purposes in blast furnaces, its use being limited only by the phosphorus content in the basic iron.

♦ ♦ ♦

LOW PERCENTAGE DESIRABLE

Ingot molds containing about 0.20 per cent molybdenum are fairly free from cutting out, according to recent experiments. Early mold failure because of cracking was encountered when the mold iron contained higher amounts of this element, particularly around 0.50 per cent.

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It offers you, in connection with the sale of Grasselli 3 Powder and Grasselli 8 Liquid Inhibitors—

A speedy and complete laboratory service for your pickling and inhibitor problems.

The services of practical picklers in your plant, endeavoring to work out, to your satisfaction, the problems you have . . . leaving with you an efficient and economical practice suited to your local conditions.

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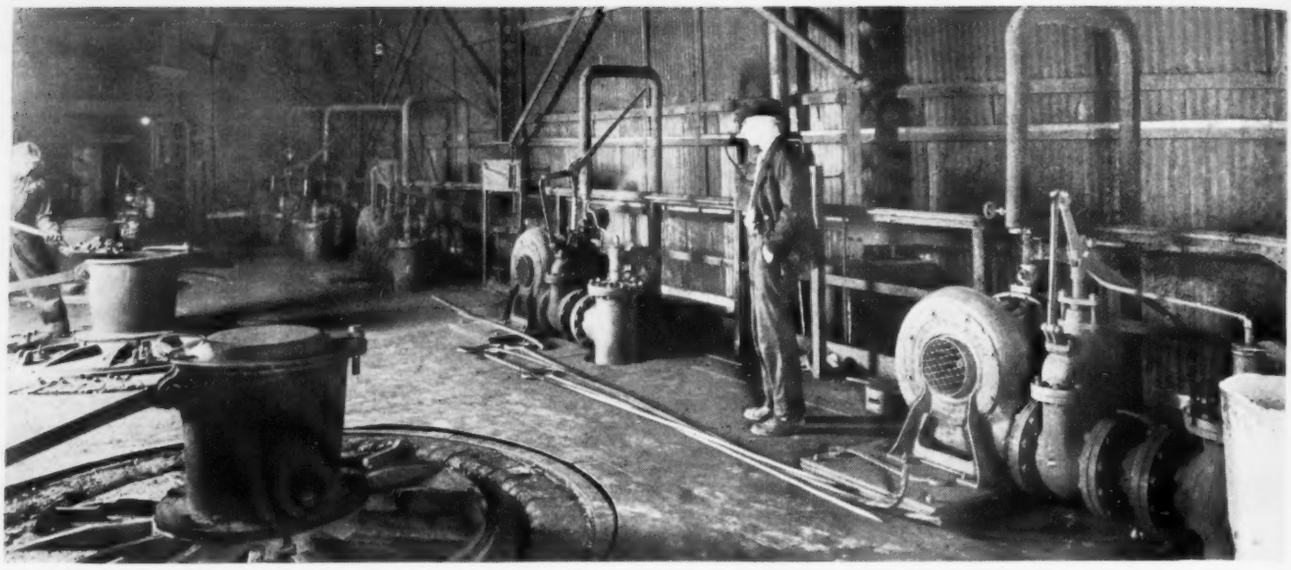


Section of a battery of 18 gas producers serving an Indiana Harbor steelworks and equipped with turbine blowers

Gas Producer Capacity Is Increased by Blowers

BY A. E. SEELIG,
President, L. J. Wing Mfg. Co., New York

WHEN gas producers first were built, it was recognized that some means had to be provided to blow the air into the producer and at the same time, some form of steam admission had to be supplied. These two requirements naturally suggested the steam jet. Its use was continued because of its low cost and the disinclination to change.

Only within the last few years have steam and air requirements been considered as entirely separate problems. The air requirements depend on the amount of coal to be gasified; the steam requirement is determined by the fusing point of the ash. But the steam used by the steam jet to deliver the air required is actually a great deal more than is necessary to keep the temperature below the clinkering point. This excess steam lowers the operating temperature still further below the fusing point, causing the producer to operate at far below the maximum possible efficiency, and also to make a gas of poor quality.

Thus, it is evident that for efficient producer operation, a method of controlling the steam admission is advisable in order to give the proper steam supply without affecting the amount of air admitted. The logical solution is the proper turbine blower.

The turbine blower is usually a centrifugal fan in a cast-iron casing, driven by a steam turbine. It usually is mounted either on the charging floor of the producer house and piped to the blast hood or on the producer floor itself, close to the blast hood.

The air supply is easily controlled by varying the speed of the turbine by means of a throttle placed in the steam line. Thus the air is regulated to maintain the required gas pressure at the furnace just as in steam jet operation.

Operation Is Simple

Control of the steam admission is entirely independent of the air delivery and is obtained as follows: The exhaust steam from the turbine is piped to the blast line at the discharge of the blower and mixed with the air supply. The turbine efficiency is much higher than that of the steam jet and it is found that the exhaust steam from the turbine is insufficient for nearly all coals. Therefore, a small amount of live steam is added to meet the steam requirements of the producer. By regulating this live steam, the proportion of steam to air is obtained which will keep the producer just below the clinkering temperature, and thus make gas of the best quality possible. In the case of a coal requiring an exceptionally low saturation, part of the exhaust steam from the turbine is bled off, and the same result obtained. The operation of a turbine blower, whether manually or automatically controlled, is just as simple as the steam jet and requires no higher order of intelligence on the part of the gas maker.

The blower, eliminating excess steam by means of independent control of steam and air admission, enables the operator to run his producer at the highest temperature consistent with the prevention of clinkers in the firebed. This results in a constant supply of rich gas with a high CO/CO_2 ratio and a high B.t.u. content, delivered to the furnace at a high temperature and more heat per pound of coal burned. At the same time, the presence of moisture in the gas and the deposit of soot and tar in the gas flues, furnace valves and burners are reduced to a minimum.

Furthermore, producer capacity is increased. The time of contact necessary between the CO_2 formed in the oxidation zone and the incandescent carbon which reduces it to CO depends on the temperature of the firebed. The higher the temperature, the shorter the time of contact necessary for complete reduction. Hence, at the high temperatures at which producers operate, more air can be forced through the firebed, more CO_2 completely reduced to CO, and more high-quality gas produced per hour. In actual cases, blowers have increased producer capacity as much as 50 per cent, often enabling two producers to do the work of three.

The advantage of maintaining a

supply of unvarying, high-quality gas under any conditions is of great value to the furnace operator. When the producer is started up, the steam supply may be diverted entirely, so that the temperature may be raised quickly, and the gas is available promptly for firing, whereas in the case of the steam jet, the full amount of steam is admitted during the starting period, with the result that it takes several hours to bring the temperature up to that necessary to produce a satisfactory gas. When producers are called upon for peak gas demands, the flexibility of such producers makes it possible to supply furnaces with large gas volume without sacrifice in quality.

Control of Steam Separate

When coals of varying characteristics are encountered in practice, they are found to require different steam-air ratios, which the jet blower cannot provide. In the case of hand-fired producers, in which the ashes are removed periodically, the internal resistance of the producer varies with the thickness of the ashbed and the steam admission of the jet blower will vary in supplying a constant volume of air, making it impossible to keep the steam-air ratio constant. So it is seen that to maintain a supply of unvarying, high-quality gas, the control of the steam admission should be separate and independent in order to adjust the blast mixture to suit the type of coal or the particular condition of the firebed.

The turbine blower, by affording independent control of steam and air admission, enables the steam consumption to be reduced — in many cases to half of that required for steam-jet operation. This saving alone often pays for the blower in less than a year's time. By this reduction in steam supply, a gas of higher B. t. u. content is generated at increased producer efficiency. In actual cases, the tonnage of coal burned has been reduced as much as 25 or 30 per cent. With a properly designed turbine blower of rugged construction, maintenance and repair costs are so small as to be a negligible factor.

Significance of Anode and Cathode Efficiencies

(*Concluded from Page* 38)

factors for a constant hydrogen ion concentration and metal iron concentration is the ratio of the anode and cathode efficiencies. If the anode efficiency is lower than the cathode efficiency, free acid is formed at the anode and consequently the hydrogen ion concentration of the solution increases. The solution will now contain sulphuric acid and nickel sulphate, provided it originally contained only nickel sulphate. Nickel will deposit faster than it dissolves, and the bath will come depleted in nickel ion. If on the other hand, the anode efficiency, is higher than the cathode efficiency, the nickel will dissolve faster than it is deposited. In this case, the nickel ion in the bath will increase and the hydrogen ion concentration of the solution will correspondingly decrease.

Mechanism of Silver Bath

Silver furnishes another good example. If a silver bath contains silver cyanide, free cyanide, and sodium carbonate, and after operation for a period it is found that the silver ion concentration has decreased, undoubtedly the cathode efficiency is greater than the anode efficiency, because more silver was deposited than was dissolved from the anode. In this case, the free cyanide should increase because the metal ion concentration has been reduced. On the other hand, if the analysis shows an increase of silver ion, one can rest assured that the anode efficiency is greater than the cathode efficiency. As the silver ion increases in solution, the free cyanide will combine with the new silver ion to give silver cyanide. Therefore the free cyanide content should decrease.

In the average plating plant, the metallic ion may vary over a wide range without any serious results, but there are certain cases where this is not true. For instance, in the plating of alloys it is important that the metal ion ratio be maintained constant, otherwise the composition of the alloy will vary. This is true in brass plating. If the copper concentration of the bath is allowed to increase, while the zinc concentration remains constant, a point is soon reached where only copper is deposited.

To keep a solution in condition to deposit brass of a certain composition, continual testing of the alloy is essential. If the alloy varies, the bath must be analyzed and corrected to the proper condition.

Summary and Conclusions

In conclusion: (1) 100 per cent cathode efficiencies are not obtainable, but these efficiencies are kept as high as possible in the plating plant; (2) although it is impossible to obtain 100 per cent anode and cathode efficiencies, it is possible to have the anode efficiency equal to the cathode efficiency; (3) if the anode efficiency is greater than the cathode efficiency, the metal ion concentration of the bath will increase, the hydrogen ion concentration will decrease, and the density of the solution will increase; (4) if the cathode efficiency is greater than the anode efficiency, the metal ion concentration will decrease, the hydrogen ion concentration will increase, and the density will decrease.

Another Bank Saved

STEEL WINS AGAINST MILL-RACE: In the heart of Rochester, N. Y., a mill-race used by a gas and electric company was eroding the bank and endangering traffic on an adjacent street. This metal cribwall was built up from units made by the American Rolling Mill Co., Middletown, O., bolted together to form a series of open bins about 4 feet wide and 6 feet 6 inches high, 40 feet long, firmly embedded in the bank. Result: The highway has been made secure against further encroachment from the stream. Such cribwalls can be extended, or re-moved and used elsewhere if desirable

A Survey of Developments in Powder Metallurgy as it Applies To Ferrous Materials

BY CHARLES HARDY

POWDER metallurgy has reached a development where it appears safe to assume that it has found a growing field in its application to ferrous metals, particularly in the mass production of small parts. There have been serious difficulties to overcome, but undeniably a promising start has been made.

The science of powder metallurgy dates back possibly 30 years—with molybdenum and tungsten. These metals, although belonging to the ferrous group, could be produced only in powder form. Later the science was applied to nonferrous metals and, although nonferrous metal powders have been used to any extent only within the past 10 years, progress has been notable. Comparatively recently, work has been started to utilize the knowledge thus gained in the development to wider application in the ferrous metal field.

In this work, considerable difficulty was experienced with grain structure, grain size and physical properties, which were of greater importance than in nonferrous metals. Further difficulty arose because of the necessity of sintering at high temperatures. This required special equipment, not always readily available. Ferrous powders, if too fine, do not flow well and, therefore, filling of dies offered additional difficulties, demanding continual changing of equipment.

Control Has Been Achieved

Now, however, it is possible to produce metal powders under close control as to grain size, grain structure and flowabiilty, and this permits the powders to be compresed in a way similar to the plastics, although this latter statement should be made with reservation as only pieces of comparatively simple shape have been made successfully by this method to date.

So far costs have been relatively high. Ferrous powders rarely are used by themselves, as users generally do not want a compresed part made from iron alone or from any single metal. Alloys containing two, three and four elements have been attempted, but the field for even ferrous alloys made from powders has been limited. Consequently, the quantities so far produced have been small, with a resultant high cost. As usual with everything new, first costs are high. As a result of these initial high costs, a number of possible users have been deterred from doing research work of their own, which would prove valuable in stimulating new applications.

In producing alloys, ferrous metals require, as previously intimated, great care in the comparative grain sizes of the various elements. Most ferrous elements readily form oxides, carbides and other impurities and, unless the process is controlled closely, particles may get an oxide or carbide skin, which transforms them from metals into refractories, preventing these particles from going into solution to form the alloy and interfering with the subsequent working of the material.

In melting, impurities such as carbides, oxides and sulphides can be eliminated through the slag. In compression, whatever is in the briquet stays in the briquet; hence, the great care necessary to prevent inclusions, occlusions and other detrimental features.

Must Eliminate Voids

A point of the greatest importance is the heat treatment of parts produced from ferrous metal powders. As we are not dealing with melting, but rather with sintering, those operations following compression are much more difficult. The parts compressed, unless subjected to subsequent working, carry a certain amount of voids. These voids are apt to be filled with water, oil, fused cyanide or some other undesirable element. Where compressed parts are subsequently worked by rolling, drawing or a second final compression, densities equal to rolled or forged metal can be obtained and the danger from voids is eliminated.

One of the greatest difficulties has been the selection of the type of carbon to be mixed with the iron to obtain the desired carbon content. Heat treatment, generally in a hydrogen atmosphere, often has resulted in decarburization.

In spite of many difficulties, research work indicates clearly that powder metallurgy has its place in both ferrous and nonferrous metals. This field is in the mass production of small parts. Where these parts are now cast and subsequently machined, the operations not only are expensive but also result in a large percentage of the metal used going into scrap. Machining operations are avoided by the compressing of powders in dies; hence this method reduces machining costs and at the same time makes possible the production of parts within specified limits, both as to weight and dimension.

Metals Used as Coatings

While ferrous metal powders rarely are used by themselves, they nevertheless have some individual uses of importance. For instance, individual metals in powder form have been used to make coatings on sheets and rods. Particularly successful has been the introduction of nickel powders for the coating of welding rods. Also, of interest, welding rods have been produced from powders of the various metals, to which is added the necessary flux. The powders and flux are compressed or extruded simultaneously, resulting in a more uniform mixture of the component metals with the flux. This easy way of controlling the amount of the component metals also allows the predetermination of the temperature desired for the weld.

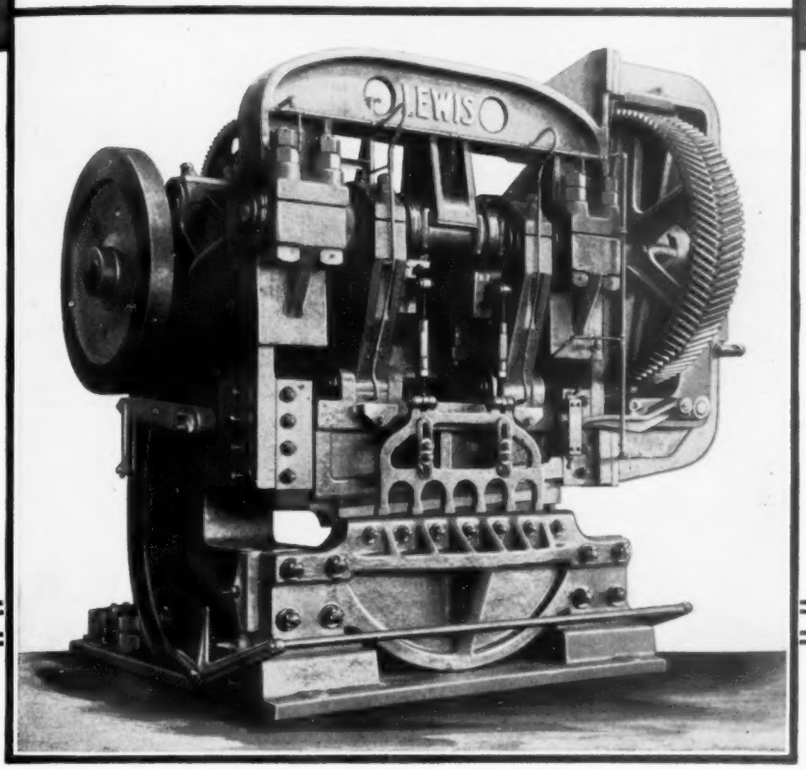
Metal powders are now produced of almost every metal. They hold a particularly valuable place in industry because combinations of metals and nonmetals can be made which are not possible in any other way. Their greatest field is where new qualities, physical or chemical characteristics, can be given to the finished products and where these new qualities outweigh questions of price.

It is the writer's opinion that powder metallurgy has advanced relatively to the point reached by the alloy steel industry 10 years ago and that from this point on we may look for greater application to the ferrous field. However, it is necessary that those who desire to apply powder metallurgy start with an entirely different concept and rid themselves of those preconceived ideas which incline them to insist upon

Mr. Hardy is president, Charles Hardy Inc., New York.

SHEARS

Plate Shear for Cutting 1½" x 66" Cold Steel.



The essential features of this Lewis Plate Shear are:

Motor operated.
Cut herringbone gears throughout.
Drive pinion heat-treated chrome nickel steel.
Automatic hold-down.
Single shot grease lubrication system.
Cast steel housings.
Platform for inspection of all gears.

★

Our Engineering Department will be glad to submit proposals for shears of all types and sizes.

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Ingot Turning Machine for Blooming Mill

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For Iron, Steel, Brass, Copper, Aluminum, Zinc and Nickel

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For Merchant Bars and Rods

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Mill Drives up to and including 6,000 HP.

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Sheet Mills	Rail Slitting Mills
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PITTSBURGH, PA.

duplicating metal structures obtained by ordinary methods.

Is it not fair to assume that when we start out with different raw materials, different producing conditions, different temperatures, we should obtain a different visible structure of the finished product, even though the physical characteristics may be equal to, if not superior to, those which have been produced by orthodox methods?

Mechanical Engineers Announce Program for Their Annual Meeting

A WELL-ROUNDED program has been scheduled for the annual meeting of the American Society of Mechanical Engineers to be held in the Engineering Societies building, New York, Dec. 3-7. Among the subjects listed for discussion are welding, materials, bearings, broaching, metal cutting, iron and steel, safety, apprentice training, mechanical springs, and many others.

Aside from technical sessions, beginning on Tuesday, Dec. 4, and continuing through Thursday, Dec. 6, the program embraces several special features. The business meeting of the society will be held on Monday afternoon, Dec. 3, and the Thurston lecture will be presented on Tuesday afternoon. Presidents' night will be celebrated on Tuesday evening.

Honor Late Secretary

Dedicated to the memory of the late Calvin W. Rice, who for many years served the society as its secretary, a Calvin W. Rice lecture will be held on Wednesday afternoon at which time Dr. Rice's contribution to international friendliness will be reviewed. The annual dinner will be served at Hotel Astor on Wednesday evening.

Concluding portions of the meeting will be held on Thursday afternoon and evening at Stevens Institute of Technology, Hoboken, N. J. A session on engineering economics will be conducted in the afternoon, to be followed by an invitation dinner at which Gantt medal presentations will be made to Wallace Clark and Horace Cheney. The meeting will close with the Towne lecture to be presented by Dexter S. Kimball, dean of the college of engineering, Cornell university, Ithaca, N. Y.

Following is a partial schedule of technical sessions and papers:

Tuesday, Dec. 4

MORNING

Welding vs. Casting

Machine Shop Practice Division

"Welding," by Everett Chapman, Lukenweld Inc., Coatesville, Pa.

"Users' Viewpoint," by Sol Einstein, Cincinnati Grinders Inc., Cincinnati.

Apprentice Training

Committee on Education and Training in Industry

"An Opportunity Analysis of College-Grade Occupations Compared With Those of the Professional Engineer," by Marion B. Richardson, Ahrens & Richardson New York.

"Apprentice School in Industrial Education," by Don F. Smith, general superintendent, General Electric Co., Erie, Pa.

Discussion of industrial training under NRA.

AFTERNOON

Safety

A.S.M.E. Safety Committee

"Problems of Occupational Diseases in Industry," by F. Robertson Jones, general manager, Association of Casualty and Surety Executives, New York.

"Administration of Occupational Disease Control," by Dr. Albert S. Gray, director, bureau of occupational diseases, department of health, Hartford Conn.

"Origin and Sources of Toxic Dust from Various Industries," by R. F. Stratton, Travelers Insurance Co., Hartford, Conn.

"Dust Control, Present and Future Design," by Theodore Hatch, instructor in sanitatary engineering, School of Public Health, Cambridge, Mass.

"Engineering Methods of Prevention of Occupational Diseases Other Than Caused by Toxic Dust."

Railroad

Railroad Division

"Alloy Steel and Its Application to Car Equipment," by J. A. Ralston, manager, railroad research bureau of the subsidiary companies of the United States Steel Corp., New York, and A. F. Steubing, railroad mechanical engineer, commercial office, United States Steel Corp., New York.

Bearing Practice

Machine Shop Practice Division Jointly with Lubrication Engineering Committee

"Current Practice in Pressures, Speeds, Clearances and Lubrication of Oil-Film Bearings," by H. A. S. Howarth, Kingsbury Machine Works, Philadelphia.

Materials

"Stress Analysis of Failures in Machine Parts," by F. A. Mickle and Dr. F. L. Everett, University of Michigan, Ann Arbor, Mich.

"Fatigue of Shafts at Fitted Members," by R. E. Peterson and A. M. Wahl, East Pittsburgh, Pa.

"Pitting of Metallic Surfaces Due to Rolling Contact," by Stewart Way, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

"Strength and Design of Covers and Flanges for Vessel Openings," by T. McLean Jasper, H. Gregerson and A. M. Zoellner, A. O. Smith Corp., Milwaukee.

Wednesday, Dec. 5

MORNING

Budgetary Control

Management Division

"Fundamentals of Budgeting," by Harold A. Hopf, H. A. Hopf & Co., New York.

"Budgeting an Industrial Enterprise," by Walter Rautenstrauch, professor of industrial engineering, Columbia university, New York.

Broaching

Machine Shop Practice Division

"Current Practice in Surface Broaching," by Joseph Geschelin, engineering editor, *Automotive Industries.*

"Progress in Machine Shop Practice," by R. E. W. Harrison, chief, machinery and agricultural implements division, department of commerce, Washington, and secretary Machine Shop Practice division.

Iron and Steel

Iron and Steel Division

"Manufacture of Large Seamless Steel Tubes by the Tschulenk Forge-Rolling Process," by Arthur J. Herschmann, agent for Vitkovice Steel Works of C. S. R., New York, and L. Tschulenk, Czechoslovakia.

"Progress in Iron and Steel Engineering."

AFTERNOON

Metal Cutting

Special Research Committee on Cutting of Metals Jointly with Machine Shop Practice Division

"Relation Between Cutting Force, Temperature and Tool Life When Cutting Steel with a Single-Point Tool," by O. W. Boston and W. W. Gilbert, University of Michigan, Ann Arbor, Mich.

"Formation and Function of the Built-Up Edge," by Hans Ernst, research engineer, Cincinnati Milling Machine Co., Cincinnati.

"Progress Report of Subcommittee on Metal Cutting Data," by R. C. Deale, secretary, subcommittee on metal-cutting data.

Iron and Steel

Iron and Steel Division Jointly with Lubrication Engineering Committee

"Wire Rope Research Report," by special research committee on wire rope.

"Lubrication of Rolling Mills—A Symposium."

"Lubricants Used by Bethlehem Steel Corp., by J. F. Pelly, Bethlehem Steel Corp., Bethlehem, Pa.

"Steel Mill Lubricating," by B. S. Burrell, Inland Steel Co., Chicago.

"Lubricants Used in Copper and Brass Mills," by Walter Clark, general manager, Bridgeport Brass Co., Bridgeport, Conn.

Thursday, Dec. 6

AFTERNOON

Mechanical Springs

"Development of Elastic Springs," by A. V. deForest, consultant, John Chatillon & Son, and Massachusetts Institute of Technology, Cambridge, Mass.

"New Spring Formulas and New Materials in Precision Spring Scale Design," by Mortimer F. Sayer, associate professor of applied mechanics, Union college, Schenectady, N. Y., and consulting engineer, John Chatillon & Son, New York.

"Analysis of Deflection and Stress in Helical Compression Springs," by H. C. Keysor, mechanical engineer, American Steel Foundries, Chicago.

Oxyacetylene Cutting in Steel Mills

Discussed at Meeting of International Acetylene Association in Pittsburgh

APPLICATIONS of the oxyacetylene process in steel mills, for cutting, welding and hard surfacing, were major subjects of discussion at one technical session of the thirty-fifth annual convention of the International Acetylene association, held at the William Penn hotel, Pittsburgh, Nov. 14-16.

Wheeling Steel Corp.'s Steubenville, O., plant, according to a paper by T. R. Moxley, general master mechanic at that plant, has found it economical to pipe its tube mill and open-hearth department for both oxygen and acetylene. Indications are that that the rest of the plant will be piped similarly.

Speaking specifically about oxyacetylene cutting of scrap, Mr. Moxley said "the distribution of oxygen and acetylene in pipelines provides a means for positive control of pressures and consumption of gases. The operators have little opportunity to waste oxygen with excessive pressures as is possible when working from cylinders. Cylinder handling by the individual operators is eliminated, thus leaving their time entirely free for productive scrap cutting. A continuous supply of gases always is available from the manifold and generators."

Sure To Have Gas when Needed

The open-hearth department is piped with an oxygen line from a central manifold station for furnace tapping. A connection is provided between the furnaces from the main oxygen line for furnace tapping and several connections are provided in the welding shop for welding and cutting. Pipe to the tap holes ranges from ¼ to ⅜-inch inside diameter.

"We have found this welded pipe oxygen line to be to our advantage in a number of ways," said Mr. Moxley. "The most important is the absolute certainty of ample oxygen to open the tap hole. There is no danger of exhausting the oxygen cylinder at a critical moment and losing the analysis by not getting the heat out at the proper time. This does happen occasionally when using single cylinders. A delay of 10 minutes in getting the tap hole opened may mean a reduction of 5 to 10 points in the manganese.

"All of you are familiar with the heat conditions behind some open-hearth furnaces and know that the oxygen cylinders frequently get too warm to lay the bare hand on; also there always is the chance that the cylinder accidentally may fall off the platform into the pit where it may come in contact with molten metal with the likelihood of accidents.

"Furthermore, less oxygen is used as there are no half empty cylinders with the remaining contents going to waste. Very few second helpers will start to open a tap hole with anything less than a full cylinder and generally about half or less of the contents of a cylinder is used in this operation. On all counts, the pipeline is a good investment in safety and economy."

12-Inch Water Line Welded

Removal of scale in the rolling operations is accomplished with hydraulic pressure of 1200 pounds per square inch, said Mr. Moxley. The water is turned on and shut off between slabs and despite accumulators in the line the pipe is subjected to shock. The line is 800 feet long and made of 12-inch extra heavy pipe, oxyacetylene welded throughout. He cited the saving in weight and expense effected by welding this line, stated that it was leakproof and free from any internal irregularities or obstructions which might hamper the free flow of water.

Mr. Moxley mentioned the alumetizing method of treating annealing boxes in order to prevent them from scaling on the outside. The boxes are covered with a sprayed aluminum coating about 0.010-inch thick on the sides and 0.020-inch thick on the tops and then covered with a layer of potassium silicate before the initial heat. The potassium silicate protects the aluminum from the high flame temperature of the furnace and gives it a chance to alloy with the iron. The aluminum oxide formed on the outside protects the box and greatly reduces scaling.

DETAILED results of tests comparing the cutting efficiencies of acetylene and propane were set forth in a paper prepared by Dr. George V. Slottman, Air Reduction Sales Co., New York, and read by E. V. David of that company. High oxygen-fuel gas ratios are characteristic of all hydrocarbon flames, other than acetylene, according to Dr. Slottman, who further stated that the tests corroborate, for oxyacetylene flames, "the theoretical prediction that propane, despite its almost twofold greater heating value available in low temperature heating, will not be equal, cubic foot for cubic foot, to acetylene in generating high temperatures for rapid steel heating.

Consumption Not Gage

"High gas consumption, in the case of the competitive fuel gases, is not the chief obstacle to their economic use in steel preheating, in view of their low price. Their major disadvantage lies in the high ratio of preheating oxygen to fuel gas, necessary to develop reasonably high temperatures. In considering their application to the welding of steel, it has been shown that the oxidizing character of the high temperature flames of these competitive fuel gases definitely restricts their use, entirely apart from any question of economies, because of the deleterious effect of an oxidizing atmosphere on weld quality. In steel cutting, their low heat liberation per volume of oxygen, as compared with acetylene, and the consequently large volume of oxygen consumed in their combustion, renders the use of these competitive fuels uneconomical under prevailing gas prices.

"Thus, the large number of oxygen cylinders, use of which is promoted by a lone propane cylinder, furnish the criterion for the poor economy of these competitive fuel gases, since the primary function of oxygen in steel cutting is the oxidation of the kerf metal and not combination with heating fuel gases."

MANY cases where the application of hardfacing enormously lengthened the life of machinery and parts subjected to severe wear, and often without lubrication due to the high operating temperatures, were cited in an interesting paper by E. E. Le Van, Haynes Stellite Co., New York. After discussing the ordinary phenomena of heat induced by friction, Mr. Le Van stated that it is not generally understood that even under conditions of moderate abrasive wear, surface temperatures are unbelievably high, and that under severe abrasive conditions, surface tem-

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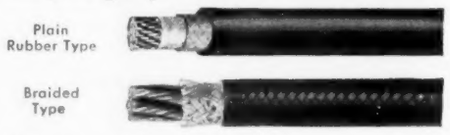
IT'S THE CUSTOM-MADE STEEL THAT SPELLS THE DIFFERENCE!

JAR WELDERS who use Roebling Welding Wire will tell you that it is outstanding for uniformity and freedom from non-metallic impurities. It should be. The steel for this wire is custom-made specifically for welding.

To begin with, only special, pure melting stock is used to make Roebling Welding Steel. Then, small open-hearth furnaces, permitting very close control of the melt, are employed in the exacting refining process. This is far different than making steel on the usual tonnage basis. And, there is a difference in the result.

You will find it worthwhile to send for samples and data on Roebling Custom-Made Welding Wire. It is made in both gas and electric types.

ROEBLING WELDING CABLES: These cables are made in a complete line for arc welding purposes. Many leading welders consider them to be the finest welding cables on the market. Samples, data and prices gladly furnished.



JOHN A. ROEBLING'S SONS CO.
Trenton, N.J. *Branches in principal cities*

ROEBLING WELDING WIRE

Custom Made

peratures often momentarily approach a red heat even though there may be little evidence of such high temperatures to the eye because of the dissipation of the heat into the body of the metal.

"An experiment using a pyrometer," said Mr. Le Van, "shows that if the exposed end of a thermocouple is held against a rotating steel disk, a temperature of 1500 degrees Fahr. will be generated on the surfaces in contact.

"It has also been calculated that if two polished steel surfaces at room temperature are pressed together with a force of 100 pounds per square inch, and moved against each other at the rate of 1 inch per second, the metal will be heated to above 1200 degrees Fahr. for a depth of 0.0001-inch. Although this depth may seem to be negligibly small, actually it contains thousands of layers of molecules. If the metal is one which softens at red heat, it will wear away rapidly, since successive layers of the metal will be quickly exposed to the heating and wearing action.

Red Hardness Important

"Since, as a general rule, harder alloys will wear less rapidly than softer ones, a consideration of these facts indicates that to resist wear successfully a material must be hard at those high surface temperatures at which the maximum wear takes place. This important property has been termed 'red-hardness' or the ability of an alloy to remain hard at red heat. Therefore, it is red-hardness and not cold hardness which determines the true ability of an alloy to resist wear.

"Fortunately, most wear is localized to such an extent that the actual wearing surfaces can be protected against abrasion by simply welding on a thin layer of hardfacing material. Thus, the bulk of the part may be made of anything from a mild steel to tough and strong alloy steels and a hardfacing alloy applied to those surfaces taking the brunt of the wear. In this manner it is possible to utilize the strength and toughness of the steel in the body of the part and the abrasion resisting qualities of the hardfaced surface."

OXYACETYLENE flame cutting of wing type ingots was discussed in a paper jointly prepared by L. Gerald Firth, president, and L. B. Knox, superintendent of melting department, Firth-Sterling Steel Co., McKeesport, Pa., and read by the former. This company casts into clover-leaf shaped molds which have three wings extending at an angle of 120 degrees from one another from a central triangle. The wings are cut off, automatically being converted into ingots, while the triangle that is left, containing the segregations, may be discarded or used for product which need not meet severe specifications. Mr. Firth gave figures for cutting the ingots by means of the oxyacetylene method; they ranged from $1.57 to $1.63 per ton of ingots, including total labor and cutting material charges.

As usual, the report of the oxyacetylene committee of the association, headed by G. C. Carter, reflected an immense amount of research and practical progress. A digest of this report, which was read by J. I. Banash, appeared on pages 54 and 55 of STEEL for Nov. 5.

Opening session of the meeting was featured by the broadcasting of three addresses over an NBC network. They included an address of welcome by John S. Fisher, former governor of Pennsylvania and now president of the Pittsburgh chamber of commerce, the president's address by H. B. Pearson, and the keynote address by B. C. Forbes, editor, *Forbes Magazine*.

The James Turner Morehead medal, in recognition of distinctive achievement in the acetylene industry, was awarded by E. J. Hayden, Linde Air Products Co., Chicago, and past president of the association, to Robert Allen Witherspoon, president and general manager, Shawinigan Chemicals Ltd., Montreal, Que. In the absence of Mr. Witherspoon because of illness, the award was acknowledged by L. F. Loutrel, Shawinigan Products Corp., New York.

Cold Work Instead Of Heat Treatment

RECENT studies by metallurgists of Union Drawn Steel Co., Massillon, O., have revealed that, by proper control of production and processes, excellent physical properties may be obtained by cold working alone. As a result, the possibilities of substituting cold work for heat treatment on certain automobile and machine parts are of decided practical importance. The company points out that this fact has been recognized and is being applied by a number of cold drawn steel consumers in the manufacture of studs, locking pins, machine shafts, counterweight screws, spring clips and other highly stressed parts.

"Applied to medium or low carbon steels," says the company in comparing effects of cold working with those of heat treatment, "a normal draft will increase the tensile strength 30 to 40 per cent and the yield point 70 to 100 per cent. The elongation and reduction of areas are somewhat decreased but the inherent toughness remains.

"When steel of medium carbon content is quenched in oil or water, the yield point and ultimate strength are increased while the elongation and reduction of area are decreased. These changes in physical properties are very similar to those produced by cold drawing. While it is true that quenching in oil or water will develop much higher tensile strength and yield point than is obtainable by the cold drawing process, it also is recognized that these properties are lowered by the tempering or drawback treatment which is necessary to overcome excessive hardness and to give the required toughness to the part."

Following a discussion of the theoretical explanations of the effects of cold drawing and heat treatment, the company concludes that there is a large field wherein cold work satisfactorily will serve as a substitute for heat treating, but that such substitution must be governed by the nature and service requirements of the part in question.

Makes Recommendations for Various Size Steel Boilers

A proposed simplified practice recommendation covering steel horizontal firebox heating boilers has been mailed to all interests in the industry for their consideration and written approval, according to the division of simplified practice, national bureau of standards, Washington.

This recommendation, approved at a general conference held in Cleveland, June 5, lists 19 sizes of boilers ranging from 1800 to 35,000 square feet of steam radiation and from 2880 to 56,000 square feet of water radiation for hand firing.

Nineteen ratings also are given for these boilers mechanically fired, ranging from 2190 to 42,500 square feet of steam radiation and from 3500 to 68,000 square feet of water radiation.

The recommendation also includes heating surface and grate area for each size of boiler. Other information includes furnace volume for oil, gas fired, or bituminous coal stoker fired boilers, together with size of outlets and number and size of safety valves.

Selecting Alloy Cast Steels

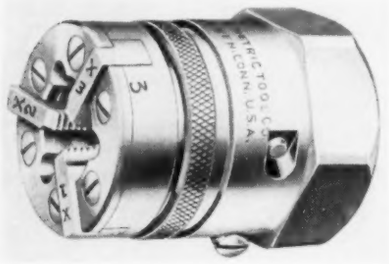
A number of special-purpose cast alloy steels have been developed, such as carburizing steels, nitriding steels or the 4-6 per cent chromium with or without the addition of molybdenum or tungsten. The 4-6 per cent chromium type is used for oil refinery or power plant service.

NEW EQUIPMENT

PRODUCTION FABRICATION
TREATMENT FINISHING

Die Head — Geometric Tool Co., New Haven, Conn., announces that it now can meet the demand for a light, removable chaser die head to cut small diameter, short length threads which are being cut with a button die, spring die or any solid die of that type. The ¼-inch style EJ die head complete with chasers weighs but three ounces. It is built to cut threads from No. 0 up to No. 14 machine screw sizes (maximum capacity ¼-inch) in pitches 20 or finer.

The die head, shown herewith, employs a set of three removable,



Style EJ Geometric solid adjustable die head for small threads

adjustable chasers. By adjusting the chasers it is possible to cut any required decimal size. Chasers can be resharpened easily. One die head is all that is needed for a wide range of diameters and pitches. While the chasers are held in place by a face plate they protrude through the face plate, thus permitting close to shoulder threading without the use of projection chasers.

• • •

Pipe Tool—Borden Co., Warren, O., has brought out a No. 6-R ratchet, shown herewith, by which ¼, ⅜, ½ and ¾-inch pipe can be threaded without changing dies or bushings. The tool can be adjusted instantly for cutting oversize or undersize

No. 6-R Borden ratchet threads ¼ to ¾-inch pipe

threads. A universal pipe guide centers the pipe accurately. Close nipples can be cut, and a new locking device is provided on top of the tool. Two sets of dies always are in the tool which is particularly adapted for iron, steel as well as brass or copper pipe.

• • •

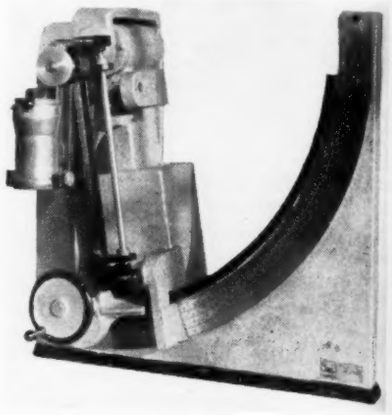
Insulation Material—United States Rubber Co., New York, is calling attention to "Laytex," a new insulation which promises to play an important part in the progress of the electrical and allied industries. As a result of the patented processes of removing materials that cause electrical leakage and as a result of the novel manufacturing method, the new product possesses physical and electrical properties vastly superior to those attributed to ordinary insulation, it is claimed. Elongation tests show that "Laytex" has a stretch of 750 per cent. This extra stretch naturally provides an important margin of safety.

• • •

Hydraulic Tube Bender—Williams, White & Co., Moline, Ill., recently brought out a new hydraulic high-speed universal pipe bender, shown herewith. The machines are built in four sizes to bend tubing ranging from 1¼ to 4 inches in diameter to radii of from 6 to 24 inches. Motors, pumps, relief valves and oil reservoir are located in the lower base casting. Various operations of the machine are controlled by hand-operated double-acting piston valves.

All moving parts of the unit are driven through racks and pinions. Relief valves open when safe load is reached, thus preventing breakage. Tubes are unloaded after bending without the operator touching the dies. The table is dropped in front so that short bends can hang down, making it unnecessary to change the machine from right to left hand for many jobs. Bending pressure is applied direct to a cast steel swinging arm and not to the shaft supporting the die. An adjustable automatic stop and graduated table front cuts set-up time to a minimum.

The rear of the table is graduated to simplify setting of the arbor pull cylinder for changes in radius. Bending dies work either right or left hand by turning them over right to



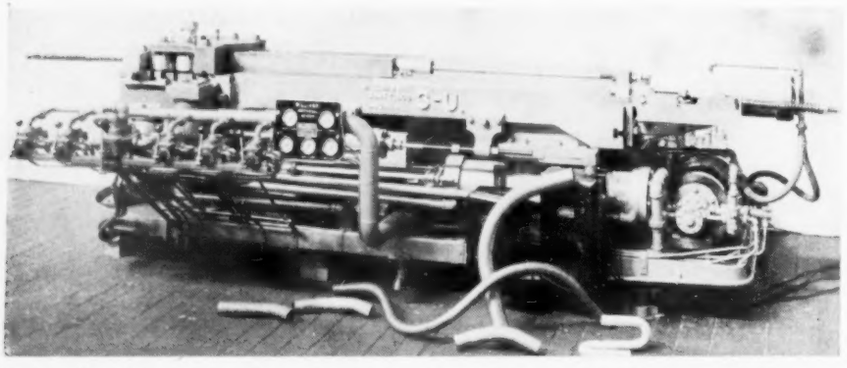
Dietert accessory for type C. P. universal sand strength machine

left. If it is desired to pull the mandrel through the tube instead of the tube off the mandrel the die is turned over front to back.

• • •

Tensile Sand Strength Accessory—Harry W. Dietert Co., 676 West Grand boulevard, Detroit, has introduced a tensile sand strength accessory which may be attached to its strength machine to test the green and dry tensile strength of molding sands. The equipment, shown above, consists of a tensile specimen tube holder and the loading mechanism. The tensile tube holder bolts to the pivot shaft of the strength machine. A hardened steel base with the aid of two clamping screws holds the tensile specimen tube rigidly in place during the test.

The sand sample is placed in the tensile specimen tube and rammed with three drops of the sand rammer weight. The cup pedestal then is removed and the specimen tube is at-



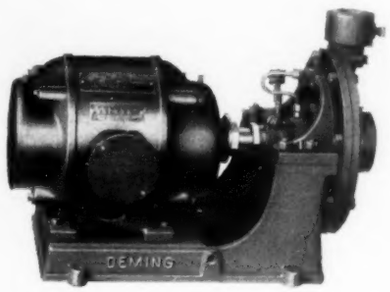
Hydraulic high-speed universal tube bender introduced by Williams, White & Co.

tached to the tensile test accessory. The sand specimen is loaded by turning the hand wheel of the strength machine and recording the maximum dry shear scale reading in grams.

The dry tensile strength of molding sand is determined in the same manner as the green test with the exception that the sand specimen is baked in the tensile specimen tube for 2 hours at 212 degrees Fahr. The short fulcrumed pivot point on the tensile test accessory is folded back and the long fulcrumed pivot point is swung into place. The readings of the dry share scale is multiplied by five to obtain the dry tensile strength in grams.

♦ ♦ ♦

Centrifugal Pumps—Deming Co., Salem, O., recently placed on the market a new line of close-coupled, side suction centrifugal pumping units. The outstanding feature of this new line resides in the fact that any make of standard ball bearing motor of the open, enclosed, splash-proof or explosion-proof type can be used. Due to the unique connection of motor and pump shafts the necessity of special motor end bells and shafts

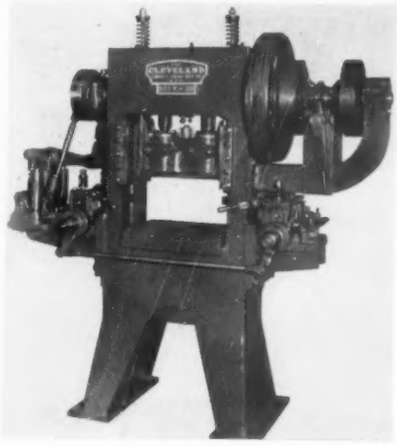


Deming close-coupled side suction centrifugal pumping unit

is eliminated. Pump and motor, shown herewith, are mounted on a substantial base plate, eliminating any unbalanced overhang of pump or motor. The cradle mounting of pump permits expansion when handling hot liquids without disturbing the alignment of the unit, it is claimed by the manufacturer.

♦ ♦ ♦

Press—Cleveland Punch & Shear Works Co., Cleveland, has developed a high-speed double eccentric all-welded steel frame press, shown herewith. The unit can be operated up to a speed of 250 revolutions per minute. It is equipped with a double roll feed and scrap cutter and is arranged for V-belt drive. A friction clutch and brake also are embodied in the design. A slide is provided with adjustment for use when setting



Cleveland high-speed double eccentric all-welded steel press

dies. This press can be furnished in a wide range of sizes and capacities.

♦ ♦ ♦

Socket Set—Bonney Forge & Tool Works, Allentown, Pa., is introducing a new socket set that is useful for work on passenger cars, buses, trucks, tractors, and industrial machinery. This outfit, known as No. RH, contains an assortment of both the standard series (½-inch square drive) and heavy-duty series (¾-inch square drive) sockets, handles and attachments. Fourteen standard series sockets, eight handles and attachments and a drag link socket are included, as are ten heavy-duty sockets and three handles and attachments. The set is packed in a large metal chest with a removable tray.

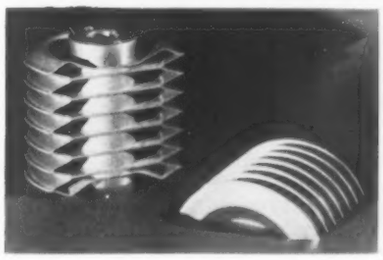
♦ ♦ ♦

Hydraulic Surface Grinder—Hill Clutch Machine & Foundry Co, 6400 Breakwater avenue, Cleveland, recently developed an improved heavy-duty 14-foot hydraulic surface grinder. The machine, shown herewith, is recommended for accuracy, speed and economy in grinding long shear blades and flat surfaces. These vertical spindle hydraulic surface grinders can be furnished in table lengths, 10 feet and longer, with or without magnetic chucks.

The head is arranged to tilt off the vertical position to permit concave grinding. Table drive is accomplished by means of a motor-driven hydraulic pump. Volume of oil is controlled in the pump, pressure remaining constant. The pump drives the table by two opposed pistons and cylinders, providing a wide range of speeds. This particular drive eliminates vibration, which permits rapid and accurate grinding. The grinding head is counterbalanced and the 5½ inch spindle is equipped with two roller bearings and one ball bearing in the center to avoid any possibility of whip.

♦ ♦ ♦

Reinforced Sheave—Allis-Chalmers Mfg. Co., Milwaukee, is introducing a reinforced steel sheave, shown herewith. Outside walls of this new development are reinforced by a convex steel plate which practically eliminates the possibility of distortion, irrespective of the strains

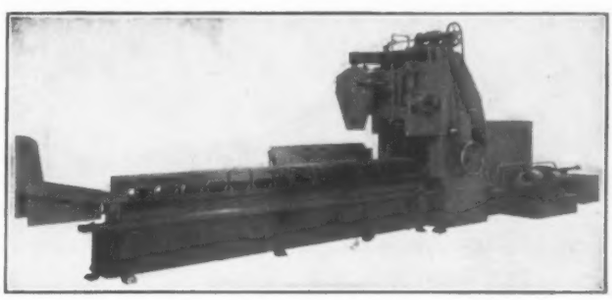


Reinforced steel sheave developed by Allis-Chalmers Mfg. Co.

to which the walls are subjected. Welding at the rim and web for additional strength, and the interior grid-type construction for rigidity, which were advantageous features of the former design are retained in the new "Duro-Brace Texsteel" sheave.

♦ ♦ ♦

Switch—Square D Co., Detroit, through its switch and panel division, is announcing a new type of 30-ampere switch. The new unit, shown on page 60, has an elevated removable base for simplified wiring, also embodies a front operating handle and the cover opens down in-



HEAVY-DUTY 14-foot hydraulic surface grinder developed by Hill Clutch Machine & Foundry Co. The head tilts off vertical position to permit concave grinding

New type of 30-ampere switch introduced by Square D Co.

stead of at the side. Blades are visible. The unusual construction permits a smaller enclosure than for the conventional type of visible blade switch. Instead of having the usual bulge, the cover design is modernistic with beveled edges. This design is obtainable in 30 ampere 2 and 3-pole fused and unfused and 3 and 4-wire solid neutral.

♦ ♦ ♦

Boron Carbide Applications—Norton Co., Worcester, Mass., recently announced that boron carbide, a new material closely approaching the diamond in hardness, now is available for numerous industrial applications. One example is its use for drilling of tungsten alloy die nibs, an operation in which silicon carbide and diamond dust formerly were employed. Another application is for lapping tungsten carbide tipped tools. Boron carbide also has been applied to such abrasive products as grinding wheels, coated abrasive paper and cloth, but general use of those will depend entirely upon economic considerations.

One important use of boron carbide is in the construction of nozzles for abrasive blasting. Extended service tests indicate that boron carbide nozzles are superior to any long-life nozzles that so far have appeared on the market. Other applications are molded jewel-type bearings, wire drawing dies, inserts, guides, tubes, etc., for wear resistance.

♦ ♦ ♦

Sandslinger — Beardsley & Piper Co., 2541 North Keeler avenue, Chicago, has brought out a new sand-

Beardsley & Piper sandslinger for production or jobbing work

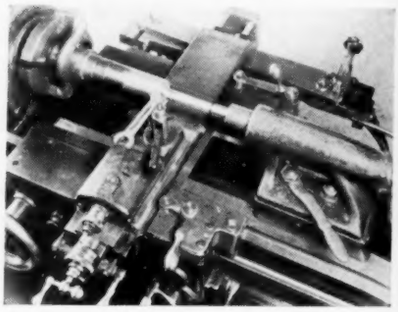
slinger. The unit, shown herewith, is the swing type designed for use on either production or jobbing work, dry or green sand molds and cores. Features include fast, uniform ramming, with density control at the operator's finger tips, instant availability on any size or shape of mold and improvement in casting quality. Its use also effects the saving of time, floor space and number of flasks required, the elimination of special flask and pattern equipment and reduction of wear and maintenance on flasks, patterns, etc.

♦ ♦ ♦

Taper Attachment—Reed-Prentice Corp., Worcester, Mass., is offering a new type taper attachment for lathes. So designed as to retain all the advantages of the telescoping cross feed screw type of attachment and arranged so as to be used as a conventional type taper attachment if desired, it is capable of turning any included angle up to 120 degrees.

This attachment, shown herewith, permits of turning a straight portion on the work to a predetermined point, at which point the taper attachment may be engaged and the taper turned to another predetermined point where it may be disengaged and the machine will resume straight turning.

Determination of the angle of taper is dependent upon both the rate of movement of the slide relative to carriage travel, and the angularity of the taper bar. Safety stops are

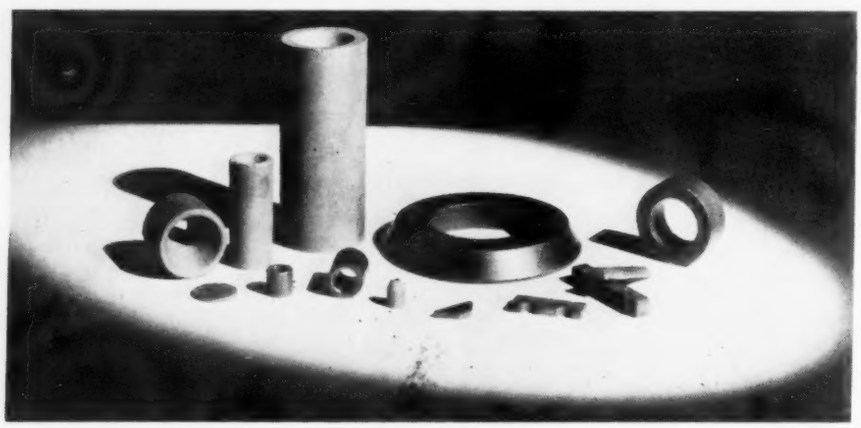


Taper attachment placed on the market by Reed-Prentice Corp.

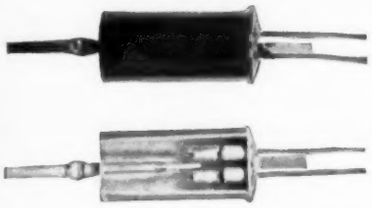
provided so that the clutch is disengaged at the limits of travel of the slide, thus preventing possibility of damage to the machine. The attachment is also made as a forming attachment and is unique in that the master form has greater length than the form produced on the work, thus permitting use of a roller follower for producing relatively sharp corners on the work.

♦ ♦ ♦

Vacuum Switch—General Electric Co., Schenectady, N. Y., has announced a new small vacuum switch, made almost entirely of steel and designed to take advantage of the absence of an arc when breaking a circuit in a high vacuum. Although this device, shown on page 61, is only about $\frac{3}{4}$ of an inch in diameter and $1\frac{1}{2}$ inches long, and can be operated by a fraction of an ounce of pressure, it is capable of interrupt-



Group of products molded from Norton boron carbide for various uses



Unique General Electric all-metal vacuum switch

ing as much as five horsepower as fast as thirty times a second.

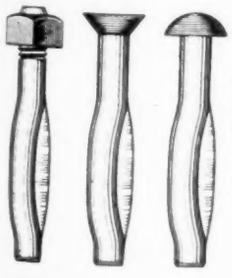
This type FA-6 vacuum switch is rated at 10 amperes, 250 volts direct current or 440 volts alternating current — or 5 amperes at 500 volts direct current.

Leading-in wires to the contacts are sealed in tiny glass beads inside small Fernico alloy thimbles which are inserted through the heavier opposite end-wall of the chamber. The metal to glass seal is a development of the General Electric research laboratory, and provides a sturdy and reliable gas-tight joint.

♦ ♦ ♦

Expansion Bolt—Rawlplug Co. Inc., 98 Lafayette street, New York, has introduced a new expansion bolt, a one-piece device for holding or attaching anything to hard materials such as concrete, brick, stone and other solid masonry. It looks like a bolt and drives in like a nail. Its simplicity and ease of using are its most remarkable features. A hole is drilled in the material—the fixture put in place—and by a few sharp blows with a hammer the device is anchored permanently.

Tests have shown a 3/16-inch "Rawl-Drive" will withstand 1200 pounds direct pull when embedded in 1-2-4 concrete and a ½-inch fastening in the same concrete will withstand 12,000 pounds pull, it is claimed. This tremendous holding power is obtained by a simple yet unique construction which provides that as the "Rawl-Drive" is driven in place the bow sides are compressed back to their original position and the tension thus secured grips the sides of the hole like a vise. The fastening is made with several style heads—the round type, countersunk type, and stud type, shown in the accompanying illustration, being the most popular.



Rawlplug expansion bolt provides one-piece device for holding or attaching anything to hard materials

♦ ♦ ♦

Meter — Bailey Meter Co., 1050 Ivanhoe road, Cleveland, recently developed a new meter to indicate and record both boiler water level and feed water flow. The device is for use in boiler plants where it is desired to have both an indication and record of these factors on the operating floor.

This combination meter consists of a standard fluid meter which indicates, records and integrates feed water flow and a 12-inch indicator with a dial type scale for boiler water level. The indicator is mounted directly above the recording meter on a small feed water panel as shown in the accompanying illustration. If desired, this combination meter can be located on an individual boiler control panel where the combination meter is mounted on the right-hand side of two individual boiler control panels standing side by side.

Bailey combination meter for indicating and recording

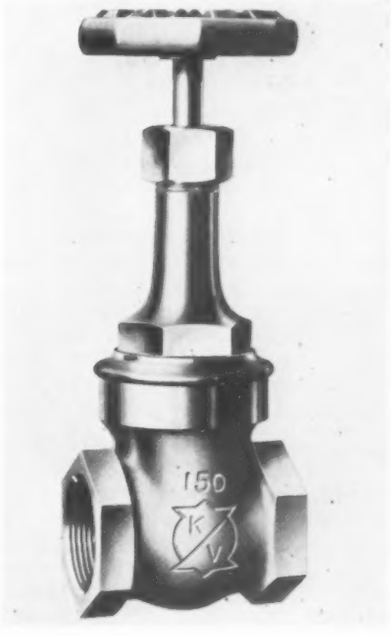
For purposes of comparison, it is valuable to have the records of feed water flow and boiler water level recorded on the same chart where they are co-ordinated as to time and can be interpreted easily wtihout reference to additional records or calculations.

Elevator Control — Quincy Elevator Gate Co., Tiffin, O., recently introduced an "Electro-Shift" which consists of a specially designed power unit that is controlled by remote constant pressure "up" and "down" buttons. The device is designed to mechanically shift the shipper rope of a cable-controlled elevator, obtaining results that are claimed to be similar to those of a two-button controlled modern elevator. Base of the unit is 15 inches wide by 24 inches long. Location may be at any point to give convenient access to the elevator shipper rope. The mechanism may be used to control hydraulic or electric elevators and also will work properly where mechanical brakes are employed.

♦ ♦ ♦

Gate Valves — Kennedy Mfg. Co., Elmira, N. Y., recently announced a new line of rising stem heavy standard bronze gate valves for 150 pounds working steam pressure and 250 pounds working water, oil or gas pressure. This valve, known as Fig. 45, is a companion type to the new Fig. 23 with stationary stem which was introduced earlier in the year. The operating mechanism employs solid wedge disks.

A flexible connection is provided between the disk and the stem so that the stem will not bind or spring when the valve is closed. The stem is made of a bronze composition with high tensile and torsional strength, and has a large number of contact threads in the bonnet.



Kennedy rising stem heavy standard bronze gate valve

Here and There In Industry

HARNISCHFEGER CORP., Milwaukee, manufacturer of cranes and other lines of equipment, observed its fiftieth anniversary Nov. 17 by open house to executives from the Middle West. During a tour of the plant the guests were given an advance view of the four 300-ton powerhouse cranes built for Boulder dam. Two will be installed in each wing of the powerhouse and will be used to lift 600-ton generator rotors being built by Allis-Chalmers Mfg. Co., Milwaukee; General Electric Co., Schenectaday, N. Y., and Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. The visitors were also shown splash-proof electric motors, electrically welded products and fabrication, a 4-yard electric shovel and other types of excavating equipment built by this company.

□ □ □

Henry J. Linn Co., 250 Stuart street, Boston, has been appointed New England sales agents for Globe Steel Tubes Co., Milwaukee, manufacturer of seamless steel tubular products, including mechanical tubing, boiler and condenser tubes and stainless steel tubing.

□ □ □

Arthur B. Shepard Inc., New York, successor to the Arthur B. Shepard Corp., heavy structural steel and sectional steel buildings, has moved its offices from 1060 Park avenue to 11 Broadway.

□ □ □

Pittsburgh Steel Drum Co., Pittsburgh, is increasing its Boston warehouse facilities. The company's new office and warehouse is now located at 40 Binney street, Cambridge, Mass. Eugene H. Cooper is in charge.

□ □ □

Societe Genevoise d'Instruments de Physique, Geneva, Switzerland, manufacturer of jig boring machines and high precision equipment, has appointed the Triplex Machine Tool Corp., 125 Barclay street, New York, its exclusive agent for its line in the United States and Canada. For many years this line was handled by the R. Y. Ferner Co., Washington, the recent death of Mr. Ferner compelling the change.

□ □ □

Dollin Corp. has been formed by Edgar N. Dollin, former president of the Allied & Acme Die Casting Corp., J. L. Cowen and Mario Caruso. Offices will be established in Sager place, Irvington, N. J. The new company will unite the die casting division of the American Type Founders Co., Jersey City, N. J., and the die casting division of the Lionel Corp., Irvington, N. J. All dies, equipment and tools of both companies have been taken over and the sales force of the American Type Founders Co. has been made part of the new company's personnel.

Production

(*Concluded from Page 20*)

54 per cent, highest rate since last June. Twenty out of 37 open-hearth furnaces are operating. A leading interest in this district has advanced its ingot melting rate to include 12 open-hearth furnaces, another interest continues unchanged with six active units, and a third smaller unit has two furnaces on. The Portsmouth, O., producer placed 18 sheet mills in operation Nov. 15.

New England—Held unchanged last week at 40 per cent, but is expected to increase this week, one steel works planning to double its operations. Output at other works will remain unchanged.

Chicago—Increased slightly less than 1 point to 31 per cent last week, the highest rate since late August. Additional gains this month and next are expected to be small, although a fairly steady rate is in prospect. Blast furnace schedules are unchanged with 8 of 36 steelworks stacks and one merchant unit in blast.

Central eastern seaboard—Fractionally lower around 20 per cent last week, with production failing to measure up so far with expectations earlier in the month. Despite improvement in output for the country as a whole, there are some trade interests now who look for virtually no gain in the local district this month.

Cleveland-Lorain—Down 5 points last week to 38 per cent, with Corrigan, McKinney Steel Co. operating eight open hearths, Otis Steel Co. three, and National Tube Co., Lorain, four. These also are the schedules for this week. Sheet and strip mill operations here will be increased from 25 per cent to 35.

Foreign

WHEN pig iron production in Russia in October averaged 30,900 tons daily it exceeded the 30,695-ton average in the United States and is believed to be the first month in modern times that soviet blast furnaces have outranked American ones. There is no question, however, that for the year Russia will rank second to the United States, and the prospect of second place again in 1935 irks M. I. Kalinin, president, who last week prodded soviet blast furnace operators. Russia expects to average 35,000 tons daily in 1935.

Meetings

CLARENCE B. RANDALL, vice president, Inland Steel Co., Chicago, and manager of ore and coal properties of that company, will speak on "Ore and Coal" before the Blast Furnace and Coke association of the Chicago district at the Hotel Shoreland, Chicago, Nov. 26.

This is the first of a series of three lectures being presented for the purpose of acquainting association members with the allied departments of the industry. H. W. Johnson, Inland Steel Co., Indiana Harbor, Ind., is secretary of the group.

PLAN CAMPAIGN TO SCRAP OBSOLESCENT MACHINERY

Machine tool manufacturers will have a leading role in initiating, during a convention of the Machinery and Allied Products institute which opens at Cincinnati, Nov. 20, a nation-wide effort to induce scrapping of obsolete machinery and factory equipment.

Cincinnati leaders in the plan include: Philip O. Geier, president, Cincinnati Milling Machine Co.; R. K. LeBlond, president, R. K. LeBlond Tool Co.; August Teuchter, president, Bickford Tool Co.; S. M. Blackburn, president, Fay & Egan Co.; E. S. Mason, vice president, J. H. Day Co.; B. J. Kaufmann, president, Edna Brass Mfg. Co.; J. C. Walter, president, Alvey-Ferguson Co., and Harry Lockwood, president, Lockwood Mfg. Co.

New Trade Publications

SHEET IRON—A primer on sheet iron has been issued in its fifth edition by Republic Steel Corp., central alloy district, Massillon, O. It contains 64 pages, illustrated, and in simple, nontechnical language tells the step-by-step story of modern manufacture of sheet iron from the ore mine to final inspection of the finished sheet. Gage tables and a glossary of metallurgical terms are included.

LUBRICATION—A newly-inaugurated publication, *Oil Ways*, is being issued by Standard Oil Co. of New Jersey, Pennsylvania, Louisiana and Colonial Beacon Oil Co. Inc., in which new uses for petroleum products are presented, particularly lubrication features. In the issue for October various uses for oils, a history of lubrication in progressive civilization, manufacture of cut nails, discussion of highly specialized greases and other features are included.

PUMPS—Among recent bulletins by the Worthington Pump & Machinery Corp., Harrison, N. J., are: W-423-B2, on automatic power pump receiver sets, vertical, triplex, single acting; S-550-B6, gas engines, vertical four-cycle; W-318-B5, two-stage volute centrifugal pumps; W-122-S1, steam pumps for marine service.

Heavier Scrap, Steel Buying Feature Markets

Youngstown Producer Purchases 50,000 Tons of Steelmaking Grades—Structural, Railroad Awards Up; Operating Rate 28 Per Cent; Labor Truce Believed Near

INCREASING activity in raw materials, with heavier steelworks scrap purchases, and larger commitments for practically all finished steel products have generated a stronger sentiment in the markets.

Steelworks operations last week advanced ½ point to 28 per cent. The sharpest rise was in the Wheeling district, up 15 points to 54 per cent, due mainly to the resumption of 18 sheet mills idle more than four months. Operations still are above the corresponding period of 1933, and, as then, moving upward, in contrast with the precipitous descent at this time in the four preceding years.

Specifications from automobile manufacturers are expanding moderately. There have been no suspensions of shipments previously released, such as intimated might develop from the President's suggestion to level out production. General Motors' orders are slow, in accordance with its plan to spread introduction of new models, and also due to Chevrolet's indecision on certain parts. Ford and Dodge are expected to start regular assemblies of new models this week. Output last week held at 16,000 cars.

An industrial truce of the type the President proposed recently appears near consummation in steel. Producers seem willing now, as in most instances in the past, to treat with representatives of their labor on a proportional basis. They object, however, to a closed union shop. The truce should minimize the danger of labor trouble in steel.

Scrap Stronger; Pig Iron More Active; 5300 Tons of Steel Pipe Purchased in Germany

Purchase of 50,000 tons of scrap by a Youngstown steelworks has given strength to the market there. STEEL's scrap composite is up 26 cents to $9.92 on advances in Pittsburgh and Chicago. Pig iron shipments to automobile foundries this month are 25 per cent higher than in the comparable period in October. Several Pittsburgh rollmakers have issued specifications for 3000 tons of charcoal iron.

Sun Oil Co., Philadelphia, has placed 5300 tons of 6-inch steel pipe for a Philadelphia-Newark, N. J., line with German interests. Los Angeles has awarded 3800 tons of welded steel pipe. At Pittsburgh 5000 tons of skelp has been purchased, and at Philadelphia 1000 tons, for casing and oil line pipe.

Structural shape awards in the week increased slightly to 17,651 tons. Bids were opened and early award is expected on 21,000 tons for the Grand Coulee, Washington, dam, and on 18,000 tons of reinforcing bars for the Fort Peck, Montana, dam. Chicago sanitary district work will require 10,000 tons of bars, and Milwaukee is about to award 4000 tons for a filtration plant. Spain is reported inquiring for 200,000 tons of structural steel for a project.

A few railroads are beginning to formulate 1935 purchasing programs, which to a large extent depend on the outcome of pending freight rate hearings, and government loans. Chesapeake & Ohio is in the market for 3500 tons of car repair parts to be delivered next year. Norfolk & Western has purchased 10,000 tons of rails, and Northern Pacific is expected this week to place 10,000 tons. The largest export shipment of railroad equipment in recent months has left Philadelphia, 10 locomotives with tenders and 15 passenger cars for Chilean railroads.

Air Corps Seeks $3,000,000 To Buy Machines, Equipment; British Trade in Notable Gains

Some substantial orders for machine tools are per cent to 812,000 tons in October; pig iron out- $3,000,000 PWA loan to buy machinery, tractors and trucks.

Iron and steel prices will be filed Tuesday to become effective Dec. 1 applicable to first quarter, and sellers say most products will be reaffirmed. Stock prices on tin plate may be eliminated. Forge interests are protesting against a reported proposal to put 5 x 5-inch billets on a bar mill basis, raising the price $11 to $14 a ton.

In addition to the increase at Wheeling, steelworks operations advanced 1 point to 21 per cent at Pittsburgh, and ½-point to 31 Chicago. Cleveland was down 5 to 38; eastern Pennsylvania ½-point to 20; Buffalo 2 to 24. Detroit was unchanged at 48; Youngstown 31; New England 40, and Birmingham 25.

Steel ingot production in Great Britain, according to STEEL's London cable, increased 10 per cent to 812,000 tons in October; pig iron output advanced 5.3 per cent to 527,100 tons; iron and steel exports 11.5 per cent to 220,927 tons, and imports 34 per cent to 120,197 tons.

STEEL's iron and steel price composite, reflecting the advance in scrap, is up 2 cents to $32.15, while the steelworks index holds at $54.

COMPOSITE MARKET AVERAGES

	Nov. 17	Nov. 10	One Month Ago Oct., 1934	Three Months Ago Aug., 1934	One Year Ago Nov., 1933	Five Years Ago Nov., 1929
Iron and Steel Composite	$32.15	$32.13	$32.10	$32.24	$30.25	$35.60
Finished Steel Composite	54.00	54.00	54.00	54.00	49.20	56.48
Steelworks Scrap Composite	9.92	9.66	9.40	9.98	9.64	14.51

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip and cast iron pipe. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

A COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

	Nov. 17, 1934	Oct. 1934	Aug. 1934	Nov. 1933
Finished Material				
Steel bars, Pittsburgh	1.80	1.80	1.80	1.75
Steel bars, Chicago	1.85	1.85	1.85	1.80
Steel bars, Philadelphia	2.09	2.09	2.09	2.04
Iron bars, Terre Haute, Ind.	1.75	1.75	1.75	1.60
Shapes, Pittsburgh	1.80	1.80	1.80	1.70
Shapes, Philadelphia	2.00½	2.00½	2.00½	1.90½
Shapes, Chicago	1.85	1.85	1.85	1.75
Tank plates, Pittsburgh	1.80	1.80	1.80	1.70
Tank plates, Philadelphia	1.98½	1.98½	1.98½	1.88½
Tank plates, Chicago	1.85	1.85	1.85	1.75
Sheets, No. 10, hot rolled, Pitts.	1.85	1.85	1.85	1.75
Sheets, No. 24, hot ann., Pitts.	2.40	2.40	2.40	2.25
Sheets, No. 24, galvan., Pitts.	3.10	3.10	3.10	2.85
Sheets, No. 10, hot rolled, Gary	1.95	1.95	1.95	1.85
Sheets, No. 24, hot anneal., Gary	2.55	2.55	2.55	2.35
Sheets, No. 24, galvan., Gary	3.20	3.20	3.20	2.95
Plain wire, Pittsburgh	2.30	2.30	2.30	2.10
Tin plate, per base box, Pitts.	5.25	5.25	5.25	4.65
Wire nails, Pittsburgh	2.60	2.60	2.60	2.10
Semifinished Material				
Sheet bars, open-hearth, Youngs.	$28.00	28.00	28.00	26.00
Sheet bars, open-hearth, Pitts.	28.00	28.00	28.00	26.00
Billets, open-hearth, Pittsburgh	27.00	27.00	27.00	26.00
Wire rods, Pittsburgh	38.00	38.00	38.00	35.00

	Nov. 17, 1934	Oct. 1934	Aug. 1934	Nov. 1933
Pig Iron				
Bessemer, del. Pittsburgh	19.76	19.76	19.76	19.26
Basic, Valley	18.00	18.00	18.00	17.00
Basic, eastern, del. eastern Pa.	19.76	19.76	19.76	17.76
No. 2 foundry, del. Pittsburgh	19.26	19.26	19.26	18.76
No. 2 foundry, Chicago	18.50	18.50	18.50	17.50
Southern No. 2, Birmingham	14.50	14.50	14.50	13.50
No. 2X eastern, del. Philadelphia	20.63	20.63	20.63	18.63
Malleable, Valley	18.50	18.50	18.50	17.50
Malleable, Chicago	18.50	18.50	18.50	17.50
Lake Superior charcoal, del. Chi.	23.54	23.54	23.54	23.54
Gray forge, del. Pittsburgh	18.63	18.80	18.88	18.38
Ferromanganese, del. Pittsburgh	89.79	89.79	89.79	87.24
Scrap				
Heavy melting steel, Pittsburgh	$11.25	10.50	11.45	11.65
Heavy melt. steel, No. 2, east. Pa.	8.35	8.00	8.25	8.45
Heavy melting steel, Chicago	9.25	8.75	9.25	8.35
Rails for rolling, Chicago	10.25	9.90	10.50	10.25
Railroad steel specialties, Chicago	9.75	9.75	10.25	9.25
Coke				
Connellsville, furnace, ovens	3.60	3.60	3.60	3.75
Connellsville, foundry, ovens	4.60	4.60	4.60	4.25
Chicago, by-product foundry, del.	9.25	9.25	9.25	9.25

Steel, Iron, Raw Material and Metals Prices

Prices conform to American Iron and Steel institute schedules. Asterisk denotes price change this week

Sheet Steel

HOT ROLLED No. 10
(24 to 48 inches wide)

Pittsburgh, base	1.85c
Gary, base	1.95c
Chicago, del.	1.98c
New York, del.	2.18c
Philadelphia, del.	2.14c
Birmingham, base	2.00c
St. Louis, del.	2.17c
F.o.b. cars, dock, Pacific ports	2.40c

HOT ROLLED ANN. No. 24

Pittsburgh, base	2.40c
Gary, base	2.50c
Chicago, del.	2.53c
Detroit, del.	2.60c
New York, del.	2.73c
Philadelphia, del.	2.69c
Birmingham, base	2.55c
St. Louis, del.	2.72c
F.o.b. cars, dock, Pacific ports	3.05c

GALVANIZED No. 24

Pittsburgh, base	3.10c
Gary, base	3.20c
Chicago, del.	3.23c
Philadelphia, del.	3.39c
New York, del.	3.43c
Birmingham, base	3.25c
St. Louis, del.	3.42c
San Francisco, f.o.b. cars, dock	3.70c

TIN MILL BLACK No. 28

Pittsburgh, base	2.75c
Gary, base	2.85c
St. Louis, del.	3.07c

COLD ROLLED No. 10

Pittsburgh, base	2.50c
Gary, base	2.60c
Detroit, delivered	2.70c
Philadelphia, del.	2.79c
New York, del.	2.83c
F.o.b. cars, dock, Pacific ports	3.10c

COLD ROLLED No. 20

Pittsburgh, base	2.95c
Gary, base	3.05c
Detroit, delivered	3.15c
Philadelphia, del.	3.24c
New York, del.	3.28c

ENAMELING SHEETS

Pittsburgh, No. 10	2.50c
Pittsburgh, No. 20	3.10c

Tin and Terne Plate

Per 100-lb. box, Pittsburgh. Gary base, 10 cents higher.

Tin plate, coke base contract	$5.25
Do., stock	$4.90
Long ternes, No. 24 unassorted	3.40c

Corrosion and Heat Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No. 304
Bars	23.00	24.00
Plates	26.00	28.00
Sheets	33.00	35.00
Hot strip	20.75	22.75
Cold strip	27.00	29.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	17.00	18.50	21.00	26.00
Plates	20.00	21.50	24.00	29.00
Sheets	25.00	28.00	31.00	35.00
Hot strip	15.75	16.75	21.75	26.75
Cold strip	20.50	22.00	27.00	35.00

Steel Plates

Pittsburgh, base	1.80c
New York, del.	2.08c
Philadelphia, del.	1.98½c
Boston, del.	2.20c
Buffalo, del.	2.03½c
Chicago or Gary base	1.85c
Cleveland, del.	1.98½c
Birmingham, base	1.95c
Coatesville, base	1.90c
Sparrows Pt., base	1.90c
Pacific Coast, f.o.b. cars, dock	2.35c
St. Louis, del.	2.07c

Structural Shapes

Pittsburgh, base	1.80c
Philadelphia, del.	2.00¼c
New York, del.	2.05¼c
Boston, del.	2.18½c
Bethlehem, base	1.90c
Chicago, base	1.85c
Cleveland, del.	1.98½c
Buffalo, base	1.90c
Gulf ports	2.20c
Birmingham, base	1.95c
Pacific Coast, f.o.b. cars, dock	2.35c

Bars

SOFT STEEL

Pittsburgh, base	1.80c
Chicago or Gary	1.85c
Duluth, base	1.95c
Birmingham, base	1.95c
Cleveland, base	1.85c
Buffalo	1.90c
Detroit, del.	1.95c
Pacific Coast ports cars, dock, c.i.f.	2.35c
Philadelphia, del.	2.09c
Boston, del.	2.20c
New York, del.	2.13c
Pitts., forg. qual.	1.95c-2.05c

RAIL STEEL
To Manufacturing Trade

Pittsburgh, base	1.70c
Chicago or Gary, base	1.75c
Moline, Ill., base	1.75c
Cleveland, base	1.75c
Buffalo, base	1.80c

IRON

Terre Haute, Ind.	1.75c
Chicago	1.80c
Philadelphia, base	1.89c
Pittsburgh, refined	2.75c-7.50c

REINFORCING

New billet, straight lengths, quoted by distributors.

Pittsburgh	2.05c
Chicago, Gary, Buffalo Cleve., Birm., Young	2.10c
Gulf ports	2.45c
Pacific coast ports f.o.b. cars dock	2.45c
Philadelphia, del.	2.34c

Rail Steel

Straight lengths quoted by distributors

Pittsburgh, base	1.90c
Chicago, Buffalo, Cleveland, Birm., Young	1.95c
Gulf ports	2.30c

Wire Products □ □

(Prices apply to straight or mixed carloads; pool cars, or less, 10c up. 10% dis. on nail extras on straight or mixed carloads to one consignee.)

Base, Pitts.-Cleve. 100 lb. keg

Standard wire nails	$2.60
Cement coated nails	2.60
Galvanized nails, 15 gage and coarser	4.60c
Do., 16 gage and finer	5.10c

(Per pound)

Polished staples	3.30c
Galvanized fence staples	3.55c
Barbed wire, galv.	3.00c
Annealed fence wire	2.45c
Galvanized fence wire	2.80c
Woven wire fencing (base column, c.l.)	$63.00
Plain wire, 6-9 gage to mfg. trade	2.30c

Anderson, Ind., (merchant products only) and Chicago up $1; Duluth up $2; Birmingham up $3.

Spring wire, Pittsburgh or Cleveland	2.90c

Do., Chicago up $1, Worcester, $2.

Cold-Finished Carbon Bars and Shafting □ □

Base Pitts., one size, shape, grade, shipment at one time to one destination

10,000 to 19,999 lbs.	2.10c
20,000 to 59,999 lbs.	2.05c
60,000 to 99,999 lbs.	2.00c
100,000 lbs. and over	1.97½c

Gary, Ind., Cleveland, up 5c; Buffalo, up 10c; Detroit, up 20c; eastern Michigan, up 25c.

Alloy Steel Bars (Hot) □

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem 2.45c

Alloy S.A.E.	Alloy Diff.	Alloy S.A.E.	Alloy Diff.
2000	0.25	3100	0.55
2100	0.55	3200	1.35
2300	1.50	3300	3.80
2500	2.25	3400	3.20

4100 0.15 to 0.25 Mo. 0.50
4600 0.20 to 0.30 Mo. 1.25-1.75 Ni. 1.05
5100 0.80-1.10 Cr. 0.45
5100 Cr. spring base
6100 bars 1.20
6100 spring 0.70
Cr., Ni., Van. 1.50
Carbon Van. 0.95
9250 Carbon base plus extras

Piling □ □

Pittsburgh	2.15c
Chicago, Buffalo	2.25c

Strip and Hoops □

Hot strip to 23⅛-in.

Pittsburgh	1.85c
Chicago, base	1.95c
Birmingham base	2.00c
Detroit, delivered	2.05c
Phila., delivered	2.14c
New York, del.	2.18c
Cooperage hoop, Pittsburgh	1.95c
Chicago	2.05c
Cold-rolled strip, Pitts., Cleve.	2.60c
Worcester, Mass.	2.80c

Rails, Track Material □

(Gross Tons)

Standard rails, mill	$36.37½
Relay rails, Pitts. 24-45 lbs.	$27.00
50-60 lbs.	$24.00
70-75 lbs.	$18.00
80-85 lbs.	$25.00
100 lbs.	$26.00
Light rails, billet qual. Pitts., Chi.	$35.00
Do., reroll. qual.	$34.00
Angle bars, mills	2.55c
Spikes, R. R. base	2.40c
Track bolts, base	3.55c
Tie plates, base	1.90c

Base, light rails 25 to 40 lbs.; 50 to 60 lbs. inclusive up $5; 16 and 20 lbs., up $1; 12 lbs. up $8; 8 and 10 lbs., up $5. Base railroad spikes 200 kegs or more; base tie plates 20 tons.

Bolts and Nuts □ □

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade for all case lots. Dec. 1, 1932, lists.

CARRIAGE BOLTS

All sizes, cut thread	70-10-10-10 off
Rolled thread, ½ x 6 and smaller	70-10-10-10 off

MACHINE BOLTS

All sizes, cut thread lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts, stud bolts, without nuts	70-10-10-10 off
Tire bolts	60-10-10 off
Stove bolts, 75 off in pkgs.; 83 off in bulk, 15,000 or more of a size.	
Rolled thread machine bolts, ½ x 6 and smaller	70-10-10-10 off
Step bolts	70-10-10 off
Elevator bolts	70-10-10 off

NUTS

S.A.E. semifinished hex.; ½ to ⅞-inch	70-10-10-10 off
Do., ½ to 1-inch	75 off
Do., over 1-inch	70-10 off

HEXAGON CAP SCREWS

Milled	85 off
Upset, 1-in., smaller	85-10 off

SQUARE HEAD SET SCREWS

Upset, 1-in., small	80 off
Headless set screws	75-10 off

Rivets, Wrought Washers

Struc., c. l., Pittsburgh, Cleveland	2.90c
Struc., c. l., Chicago	3.00c
⅞-in. and smaller, Pitts., Chi., Cleve.	70 and 5 off
Wrought washers, Pitts., Chi., Phila.	6.00 off

Cut Nails □ □

Cut nails, Pitts.; (10% discount on size extras)	$2.75
Do. less carloads, 5 kegs or more no discount on size extras	$3.05
Do. under 5 kegs; no discount on size extras	$3.20

Pipe and Tubing

Base $200 net ton, except on standard commercial seamless boiler tubes under 2 inches and cold drawn seamless tubing.

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts., Lorain, O., to consumers in carloads, Gary, Ind., 2 points less. Chicago delivered 2½ points less. Wrought pipe, Pittsburgh base.

BUTT WELD

In.	Steel Blk.	Steel Gal.
¼ and ⅜	53½	35
½	58½	47
¾	62	52
1—3	64	55
Iron		
½	31½	15
¾	36½	20½
1—1¼	39½	25½
2	41½	26

LAP WELD

	Steel	
2	60	51
2½—3	63	54
3½—6	65	56
7 and 8	64	54
9 and 10	63½	53½
Iron		
2	37	22½
2¼—3½	38	25
4—8	40	28½

LINE PIPE

	Steel
½, butt weld	57½
⅛-inch, butt weld	50½
¼—⅜, butt weld	52½
¾, butt weld	61
1—3, butt weld	63
2-inch, lap weld	59
2½—3, lap weld	62
3½—6, lap weld	64
7—8, lap weld	63
Iron	
⅛—1½-inch, black and galv.	take 4 pts. over; 2½—6-inch 2 pts. over discounts for same sizes, standard pipe lists. 8—12-inch, no extra.

BOILER TUBES

C. L. Discounts, f.o.b. Pitts.

Lap Weld Steel		*Charcoal Iron*	
2—2¼	33	1¾	8
2½—2¾	40	2—2¼	13
3	47	2½—2¾	16
3¼—3½	50	3	17
4	52	3¼—3½	18
4½—5	42	4	20
		4½	21

In lots of a carload or more, above discounts subject to preferential of two 5% and one 7½% discount on steel and 10% on charcoal iron.

Lapwelded steel: 2000 to 9999 pounds, ten points under base, one 5% and one 7½%. Under 2000 pounds 15 points under base, one 5% and one 7½%. Charcoal iron: 10,000 pounds to carloads, base less 5%; under 10,000 pounds, two points under base only.

SEAMLESS BOILER TUBES

Under date of May 15 in lots of 40,000 pounds or more for cold-drawn boiler tubes and in lots of 40,000 pounds or feet or more for hot-finished boiler tubes, revised prices are quoted for 55 cold-drawn boiler tube sizes ranging from ¼ to 6-inch outside diameter in 30 wall thicknesses, decimal equivalent from 0.035 to 1.000, on a dollars and cents basis per 100 feet and per pound.

Hot-finished carbon steel boiler tube prices also under date of May 15 range from 1 through 7 inches outside diameter, inclusive, and embrace 47 size classifications in 22 decimal wall thicknesses ranging from 0.109 to 1.000, prices also being on a lb. and 100 ft. basis.

Seamless Tubing □

Cold drawn; f.o.b. mill disc.

100 ft. or 150 lbs.	32%
15,000 ft. or 22,500 lbs.	70%

Cast Iron Water Pipe □

Class B Pipe—Per Net Ton

6-in. & over, Birm.	$38.00-39.00
4-in., Birmingham	41.00-42.00
4-in., Chicago	49.00-50.00
6 to 24-in., Chicago	46.00-47.00
6-in. & over, east fdy.	42.00
Do., 4-in.	45.00

Class A pipe $2 over Class B. Stnd. fitgs., Birm. base $100.00

Semifinished Steel □

BILLETS AND BLOOMS

4 x4 -inch base; gross ton

Pitts., Chi., Cleve., and Youngstown	$27.00
Philadelphia	32.30
Duluth	31.00
Forging, Pitts., Chi. and Buffalo	32.00
Forging, Duluth	36.00

SHEET BARS

Pitts., Cleve., Young., Chi., Buff., Canton, O., and Sparrows Point, Md.	28.00

SLABS

Pitts., Cleve., Young.	27.00

WIRE RODS

Pitts., Cleveland	38.00
Chicago	39.00
Worcester, Mass.	40.00

SKELP

Pitts., Chicago	1.70c

Coke □ □ □

Price Per Net Ton

BEEHIVE OVENS

Connellsville, fur.	$3.60- 3.85
Connellsville, fdry.	4.60
Connell. prem. fdry.	5.10
New River fdry.	6.00
Wise county fdry.	4.45- 5.25
Wise county fur.	4.00- 4.50

BY-PRODUCT FOUNDRY

Newark, N. J., del.	8.71- 9.31
Chi., ov., outside del.	8.50
Chicago, del.	9.25
New England, del.	11.00
St. Louis, del.	9.25
Birmingham, ovens	6.00
Indianapolis, del.	8.75
Cincinnati, del.	9.30
Cleveland, del.	9.25
Buffalo, ovens	7.50- 8.00
Detroit, ovens	8.50
Philadelphia, del.	9.00

Coke By-Products □

Per gallon, producers' plants.

Tank lots

	Spot
Pure benzol	19.00c
90 per cent benzol	19.00c
Toluol	30.00c
Solvent naphtha	26.00c
Commercial xylol	26.00c

Per lb. f.o.b. New York

Phenol (200 lb. drums)	16.30c
Do. (100 lbs.)	17.30c

Eastern Plants, per lb.

†Naphthalene flakes and balls, in bbl.	6.00c

Per 100 lb. Atlantic seaboard

Sulphate of ammonia	$1.20

†Western prices, ½-cent up.

Pig Iron

Delivered prices do not include switching charges except as noted. No. 2 foundry iron is 1.75-2.25 silicon; 25-cent differentials apply for each 0.25 silicon above 2.25; 50-cent differentials apply to any grade below 1.75. Gross tons.

BASING POINTS:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem Pa.	$19.50	$20.00	$19.00	$20.50
Birdsboro, Pa.	19.50	20.00	19.00	20.50
Birmingham, Ala., southern del.	14.50	.....	13.50	19.00
Buffalo	18.50	19.00	17.50	19.50
Chicago	18.50	18.50	18.00	19.00
Cleveland	18.50	18.50	18.00	19.00
Detroit	18.50	18.50	18.00	19.00
Duluth	19.00	19.00	.....	19.50
Erie, Pa.	18.50	19.00	18.00	19.50
Everett, Mass.	19.50	20.00	19.00	20.50
Granite City, Ill.	18.50	18.50	18.00	.....
Hamilton, O.	18.50	18.50	18.00	19.00
Jackson, O.	20.25	20.25	19.75	.....
Neville Island, Pa.	18.50	18.50	18.00	19.00
Provo, Utah	17.50	.....	17.00	.....
Sharpsville, Pa.	18.50	18.50	18.00	19.00
Sparrows Point, Md.	19.50	.....	19.00	.....
Swedeland, Pa.	19.50	20.00	19.00	20.50
Toledo, O.	18.50	18.50	18.00	19.00
Youngstown, O.	18.50	18.50	18.00	19.00
DELIVERED FROM BASING POINTS:				
Akron, O., from Cleveland	19.76	19.76	19.26	20.26
Baltimore from Birmingham	20.02	.....	19.90	.....
Boston from Birmingham	19.62	.....	19.50	.....
Boston from Everett, Mass.	20.00	20.50	19.50	21.00
Boston from Buffalo	20.00	20.50	19.50	21.00
Brooklyn, N. Y., from Bethlehem	21.77	22.27	.....	.....
Brooklyn, N. Y., from Bmghm.	†21.39	.....	.....	.....
Canton, O., from Cleveland	19.76	19.76	19.26	20.26
Chicago from Birmingham	†18.72	.....	18.60	.....
Cincinnati from Hamilton, O.	19.51	19.51	19.01	.....
Cincinnati from Birmingham	19.13	.....	19.01	.....
Cleveland from Birmingham	18.62	.....	18.50	.....
Indianapolis from Hamilton, O.	20.77	20.77	20.27	21.27
Mansfield, O., from Toledo, O.	20.26	20.26	19.76	20.76
Milwaukee from Chicago	19.50	19.50	19.00	20.00
Muskegon, Mich., from Chicago, Toledo or Detroit	21.40	21.40	20.90	21.90
Newark, N. J., from Birmingham	20.51	.....	.....	.....
Newark, N. J., from Bethlehem	20.89	21.39	.....	.....
Philadelphia from Birmingham	19.88	.....	19.76	.....
Philadelphia from Swedeland, Pa.	20.26	20.76	19.76	.....
Pittsburgh district from Neville Island	(Neville Island base, plus 63c, 76c and $1.13 switching chgs.)			
Saginaw, Mich., from Detroit	20.60	20.60	20.10	21.10
St. Louis from Granite City, Ill.	19.00	19.00	18.50	.....
St. Louis from Birmingham	18.62	.....	18.50	.....
St. Paul from Duluth	20.94	20.94	.....	21.44

†Over 0.70 phos.

LOW PHOS.

Basing Points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.—$23.50. Basing Point: †Johnson City, Tenn.—$23.50

†Off grade material is $19.50

Philadelphia, standard and copper bearing	24.63

GRAY FORGE		CHARCOAL	
Valley furnace	18.00	Lake Superior fur.	21.00
Pitts. dist. fur.	18.00	Do., del. Chicago	24.04

SILVERY†

Jackson County, O., base; 6%—$22.75; 7—$23.75; 8—$2 75; 9—$25.70; 10—$26.75; 11—$27.75. Buffalo base prices $1.25 higher.

BESSEMER FERROSILICON†

Jackson County, O., base; 10%—$27.75; 11—$28.75; 12—$30 25; 13—$31.75; 14—$33.25; 15—$34.75; 16—$36.25. Buffalo base prices $1.25 higher.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Iron Ore

LAKE SUPERIOR ORE

Gross ton, 51½% Lower Lake Ports

Old range bessemer	$4.80
Mesabi nonbess.	4.50
High phosphorus	4.40
Mesabi bessemer	4.65
Old range nonbess	4.65

EASTERN LOCAL ORES

Cents, unit, del. E. Pa.

Foundry and basic 56-63% con. (nom.)	8.00- 9.00
Cop.-free low phos. 58-60% (nom.)	10.00-10.50

FOREIGN ORE

Cents per unit, f.a.s. Atlantic ports (nominal)

Foreign manganiferous ore, 45.55% iron, 6-10% man.	10.00
No. Afr. & low phos.	9.50
Swedish basic, 65%	9.00
Swedish low phos.	9.50
Spanish No. Africa basic, 50 to 60%	9.00
Tungsten, spot, sh. ton unit, duty pd.	$17.75-18.25
N. F. fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	$18.00

Manganese Ore

(Nominal)

Prices, not including duty, cents per unit cargo lots.

Caucasian, 52-55%	26.00
So. African, 52%	26.00
So. Afr., 49-51%	24.00
Indian, 58-50%	nominal
Indian, 48-50%	nominal

Refractories

Per 1000 f.o.b. Works

FIRE CLAY BRICK

First Quality

Pa., Ill., Ky., Md., Ga., Mo.	$45.00
Alabama	45.00

Second Quality

Pa., Ill., Ky., Md., Mo., Ga., Ala.	40.00

Ohio

First quality	$40.00
Intermediary	36.00
Second quality	25.00

MALLEABLE BUNG BRICK All bases	50.00

SILICA BRICK

Pennsylvania	$45.00
Joliet, E. Chicago	54.00
Birmingham, Ala.	52.00

MAGNESITE

Imported dead-burned grains, net ton f.o.b. Chester Pa., and Baltimore bases	$45.00
Domestic dead-burned grains, net ton f.o.b. Chester Pa., and Baltimore bases	40.00
Domestic dead-burned grain, net ton f.o.b Chewelah, Wash.	22.00

BASIC BRICK

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Magnesite brick	$65.00
Chrome brick	45.00
Chemically bonded magnesite	55.00

Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton	$19.50
Washed gravel, f.o.b. Ill., Key., net ton, carloads	$15.50-16.00

Ferroalloys

Dollars, except Ferrochrome

Ferromanganese, 78-82% tidewater, duty paid	85.00
Do., Balti. base	85.00
Do., del. Pittsburgh	89.79
Spiegeleisen, 19-20% dom. fur. spot†	26.00
Ferrosilicon 50%, freight all., cl.	77.50
Do., less carload	85.00
Do., 75 per cent	126-130.00

Spot, $5 a ton higher.

Silicomang., 2½ carb.	90.00
2% carbon, 95.00; 1%, 105.00	
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. con. del.	10.00
Ferrotungsten, stand., lb. cont. del.	1.35- 1.45
Ferrovanadium, 35 to 40% lb., cont., on analysis	2.70- 2.90
Ferrotitanium, c. l., prod. plant, frt. allow., net ton	137.50
Spot, 1 ton, frt. allow., lb.	7.00
Do., under 1 ton	7.50
Ferrophosphorus, per ton, c. l., 17-19% Rockdale Tenn., basis, 18%, $2 unitage	42.00
Ferrophosphorus, electrolytic, per ton c. l. 23-26% f.o.b. Anniston, Ala., 24% $2.75 unitage	55.00
Ferromolybdenum stand. 50-60%, lb.	0.95
Molybdate, lb. cont	0.80

†Carloads. Quan. diff. apply.

Nonferrous Mill Products

F.o.b. mill base, cents per lb. except as specified. Copper, brass products based on 9.00c Conn. copper

Sheets

Yellow brass (high)	14.50
Copper, hot rolled	16.00
Lead, cut, to jobbers	7.50
Zinc, 100-lb. base	9.50

Tubes and Pipes

High yellow brass	17.00
Seamless copper	17.25

Rods

High yellow brass	13.00
Copper, hot rolled	13.25

Anodes

Copper untrimmed	13.75

Wire

Yellow brass (high)	15.00

Old Metals

Deal, buying prices, cents lb

No. 1 Composition Red Brass

New York	4.25- 4.50
Chicago	4.25- 4.50
*Cleveland	4.50- 4.75
St. Louis	4.25- 4.50

Heavy Copper and Wire

New York	5.50- 5.75
Chicago, No. 1	5.50- 5.75
*Cleveland	4.75- 5.25
St. Louis	5.00- 5.25

Composition Brass Borings

New York	3.87½-4.12½

Light Copper

New York	4.50- 4.75
Chicago	4.12½-4.37½
Cleveland	4.25- 4.75
St. Louis	4.25- 4.50

Light Brass

Chicago	2.12½-2.37½
*Cleveland	2.25- 2.50

Lead

New York	2.75- 2.87½
*Cleveland	2.50- 2.80
*Chicago	2.50- 2.75
St. Louis	2.75- 2.85

Zinc

New York	1.75- 2.00
*Cleveland	1.75- 2.00
St Louis	2.50- 2.60

Aluminum

Borings, Cleveland	6.00- 7.00
*Mixed, cast, Cleve.	11.25-11.75
Mixed, cast, St. L.	10.50-11.00
Clips, soft, Cleve.	12.00-13.00

Secondary Metals

Brass ingot, 85-5-5-5	8.25
Stand. No. 12 Alum.	15.00

Iron and Steel Scrap Prices

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL

Birmingham	8.00- 8.50
Boston, dealers	5.00- 5.25
Buffalo, No. 1	9.50-10.00
Buffalo, No. 2	8.50- 9.00
Chicago, No. 1	9.00- 9.50
Cleveland, No. 1	8.00- 8.50
Cleveland, No. 2	7.50- 8.00
Detroit, No. 1	7.75- 8.25
Detroit, No. 2	6.75- 7.25
Eastern Pa.	9.75-10.00
Eastern Pa., No. 2	8.00- 8.75
Federal, Ill.	7.00- 7.50
Granite City, R. R.	6.50- 7.00
Granite City, No. 2	6.00- 6.50
N. Y., deal. R. R.	8.00
N. Y., deal. No. 2	6.50
Pittsburgh, No. 1	11.00-11.50
St. Louis	6.50- 7.00
Valleys, No. 1	11.00

COMPRESSED SHEETS

Buffalo, dealers	8.50- 9.00
Chicago, factory	8.00- 8.50
Cleveland	7.00- 7.50
Detroit	7.75- 8.25
E. Pa., new mat.	9.50-10.00
Pittsburgh	11.00-11.50
St. Louis	5.00- 5.50
Valleys	10.50

BUNDLED SHEETS

Buffalo	6.50- 7.00
Cincinnati, del.	6.00- 6.50
Cleveland	6.50- 7.00
Pittsburgh	9.50-10.00
St. Louis	4.00- 4.25

SHEET CLIPPINGS, LOOSE

Chicago	4.00- 4.50
Cincinnati	4.50- 5.00
Detroit	4.50- 5.00
St. Louis	3.50- 4.00

STEEL RAILS, SHORT

Birmingham	10.00-10.50
Buffalo	11.50-12.00
Chicago (3 ft.)	10.50-11.00
Chicago (2 ft.)	11.50-12.00
Cincinnati, del.	9.75-10.25
Detroit	10.50-11.00
Pitts., open-hearth, 3 ft. and less	14.00-14.50
St. Louis, 2 ft. & less	10.00-10.50

STEEL RAILS, SCRAP

Boston	5.00- 5.25
Chicago	9.00- 9.50
Pittsburgh	10.00-10.50

STOVE PLATE

Birmingham	5.50- 6.00
Boston, dealers	3.25- 3.75
Buffalo	8.50- 9.00
Chicago, net	5.50- 6.00
Cincinnati, dealers	5.00- 5.50
Detroit, net	6.00- 6.50
Eastern Pa.	8.50
N. Y., deal. fdry.	6.00
St. Louis	5.00- 5.50

COUPLERS, SPRINGS

Buffalo	12.00-12.50
Chicago, springs	9.50-10.00
Eastern Pa.	12.50-13.00
Pittsburgh	14.00-14.50
St. Louis	8.00- 8.50

ANGLE BARS—STEEL

Chicago	9.00- 9.50
St. Louis	7.50- 8.00

RAILROAD SPECIALTIES

Chicago	9.50-10.00

LOW PHOSPHORUS

Buffalo, billets and bloom crops	11.50-12.00
Cleveland, billet, bloom crops	13.00-13.50
Eastern Pa., crops	13.50-14.00
Pittsburgh, billet, bloom crops	14.00-14.50
Pittsburgh, sheet bar crops	13.50-14.00

FROGS, SWITCHES

Chicago	9.00- 9.50
St. Louis, cut	8.00- 8.50

SHOVELING STEEL

Chicago	9.00- 9.50
Federal, Ill.	6.75- 7.00
Granite City, Ill.	6.00- 6.50

RAILROAD WROUGHT

Birmingham	7.00- 7.50
Boston, dealers	6.00- 6.50
Buffalo, No. 1	7.50- 8.00
Buffalo, No. 2	9.50-10.00
Chicago, No. 1, net	7.00- 7.50
Chicago, No. 2	9.00- 9.50
Cincinnati, No. 2	7.00- 7.50
Eastern Pa.	10.50
N. Y., No. 1, deal.	7.00- 7.50
St. Louis, No. 1	5.75- 6.25
St. Louis, No. 2	6.75- 7.25

SPECIFICATION PIPE

Boston	3.00- 3.25
Eastern Pa.	8.00
New York, dealers	3.50- 4.00

BUSHELING

Buffalo, No. 1	8.50- 9.00
Chicago, No. 1	7.00- 7.50
Cinci., No. 1, deal.	5.50- 6.00
Cincinnati, No. 2	3.50- 4.00
Cleveland, No. 2	6.50- 7.00
Detroit, No. 1, new	6.75- 7.25
Valleys, new No. 1	10.25

MACHINE TURNINGS

Birmingham	4.50- 5.00
Boston, dealers	1.25- 1.50
Buffalo	4.75- 5.25
Chicago	4.50- 5.00
Cincinnati, dealers	4.00- 4.50
Cleveland	6.00- 6.50
Detroit	4.50- 5.00
Eastern Pa.	5.50
New York, dealers	1.75- 2.00
Pittsburgh	7.25- 7.75
St. Louis	3.00- 3.50
Valleys	7.75- 8.25

BORINGS AND TURNINGS

For Blast Furnace Use

Boston, dealers	3.25- 3.50
Buffalo	5.50- 6.00
Cincinnati, dealers	4.00- 4.50
Cleveland	6.50- 7.00
Detroit	5.75- 6.25
Eastern Pa.	5.00
New York, dealers	1.50- 1.75
Pittsburgh	5.50- 6.00

CAST IRON BORINGS

Birmingham, plain	4.50- 5.00
Boston, chemical	8.50- 9.00
Boston, dealers	3.25- 3.50
Buffalo	5.50- 6.00
Chicago	5.00- 5.50
Cincinnati, dealers	4.00- 4.50
Cleveland	6.75- 7.25
Detroit	5.75- 6.25
E. Pa., chemical	12.00-13.00
New York, dealers	1.50- 1.75
Pittsburgh	5.50- 6.00
St. Louis	3.00- 3.50

PIPE AND FLUES

Cincinnati, dealers	4.00- 4.50

RAILROAD GRATE BARS

Buffalo	6.50- 7.00
Chicago, net	5.00- 5.50
Cincinnati	4.00- 4.50
Eastern Pa.	8.00- 8.50
New York, dealers	4.00- 4.50
St. Louis	4.00- 4.50

FORGE FLASHINGS

Boston, dealers	3.75- 4.00
Buffalo	8.50- 9.00
Cleveland	7.00- 7.50
Detroit	6.25- 6.75

FORGE SCRAP

Boston, dealers	3.75- 4.00
Chicago, heavy	9.50-10.00
Eastern Pa.	9.00

ARCH BARS, TRANSOMS

St. Louis	10.00-10.50

AXLE TURNINGS

Boston, dealers	3.00- 3.50
Buffalo	7.00- 7.50
Chicago, elec. fur.	8.00- 8.50
Cleveland	6.00- 6.50
Eastern Pa.	9.00- 9.50
St. Louis	6.00- 6.25

STEEL CAR AXLES

Birmingham	10.00-10.50
Boston, ship. point.	10.00-10.50
Buffalo	12.00-12.50
Chicago, net	10.00-10.50
Eastern Pa.	14.00-15.00
St. Louis	10.75-11.25

SHAFTING

Boston, ship. point.	11.00-11.25
Eastern Pa.	16.00-16.50
New York, dealers	10.75-11.25
St. Louis	11.00-11.50

CAR WHEELS

Birmingham, iron	9.00- 9.50
Boston, iron deal.	5.00- 5.50
Buffalo, iron	11.00-11.50
Buffalo, steel	12.00-12.50
Chicago, iron	9.50-10.00
Chicago, rolled steel	9.50-10.00
Cincinnati, iron	7.50- 8.00
Eastern Pa., iron	10.50-11.00
Eastern Pa., steel	12.50-13.00
Pittsburgh, iron	10.50-11.00
Pittsburgh, steel	14.00-14.50
St. Louis, iron	7.25- 7.75
St. Louis, steel	8.75- 9.25

NO. 1 CAST SCRAP

Birmingham	8.50- 9.00
Boston, No. 2	6.00
Boston, tex. con.	8.50- 9.00
Buffalo, cupola	9.50-10.00
Buffalo, mach.	10.50-11.00
Chicago, agri. net	7.50- 8.00
Chicago, mach. net	8.50- 9.00
Chicago railroad net	8.00- 8.50
Cinci., mach. cup	8.50- 9.00
Cleveland, cupola	10.75-11.25
Detroit, net	8.50- 9.00
Eastern Pa., cupola	11.00
Pittsburgh, cupola	12.25-12.75
San Francisco, del.	13.50-14.00
Seattle	7.00- 8.50
St. Louis, No. 1	6.50- 7.00
St. L., No. 1 mach.	8.50- 9.00

HEAVY CAST

Boston, del.	4.50- 4.75
Buffalo, break.	7.75- 8.25
Cleveland, break.	7.50- 8.00
Detroit, break.	6.50- 7.00
Detroit, auto net	9.00- 9.50
Eastern Pa.	10.00
N. Y., break. deal.	5.25- 5.75
Pittsburgh	10.00-10.50

MALLEABLE

Boston, consum.	10.00-10.50
Buffalo	10.50-11.00
Chicago, R. R.	10.00-10.50
Cincinnati, agri. del.	7.50- 8.00
Cleveland, rail	10.75-11.25
Detroit, auto	8.75- 9.25
St. Louis, R. R.	7.00- 7.50
Eastern Pa., R. R.	10.50-11.00

RAILS FOR ROLLING

5 feet and over

Birmingham	9.50-10.00
Boston, dealers	8.00- 8.50
Buffalo	10.25-10.75
Chicago	10.00-10.50
Eastern Pa.	12.00-12.50
New York, dealer	7.50- 8.00
St. Louis	9.00- 9.50

LOCOMOTIVE TIRES

Chicago (cut)	9.00- 9.50
St. Louis, No. 1	9.50-10.00

LOW PHOS. PUNCHINGS

Buffalo	12.00-12.50
Chicago	11.00-11.50
Eastern Pa.	14.50-15.00
Pittsburgh	13.00-13.50

Nonferrous Metal Prices of the Week

Spot unless otherwise specified. Cents per pound

	Copper, Electro., del. Conn.	Copper, Lake, del. Midwest	Copper, Casting, refinery	Straits Tin, New York Spot	Straits Tin, New York Futures	Lead, New York	Lead, East St. L.	Zinc, St. L.	Aluminum 99%	Antimony Spot, N. Y.	Nickel Cathodes
Nov. 10	9.00	9.12½	7.37½	51.15	51.22½	3.60	3.45	3.75	*19.00	11.50	35.00
Nov. 12—Holiday											
Nov. 13	9.00	9.12½	7.37½	51.30	51.40	3.60	3.45	3.75	*19.00	11.75	35.00
Nov. 14	9.00	9.12½	7.37½	51.20	51.30	3.60	3.45	3.75	*19.00	13.25	35.00
Nov. 15	9.00	9.12½	7.37½	51.20	51.27½	3.60	3.45	3.75	*19.00	13.25	35.00
Nov. 16	9.00	9.12½	7.37½	51.20	51.27½	3.55	3.40	3.72½	*19.00	13.25	35.00

*Nominal range 19.00c to 21.00c.

Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS	□
Baltimore*	2.90c
Boston††	2.95c
Buffalo	3.00c
Chattanooga	3.31c
Chicago	2.95c
Cincinnati	3.15c
Cleveland	2.95c
Detroit	3.03½c
Houston	3.00c
Los Angeles	3.70c
New Orleans	3.30c
New York‡(d)	3.22c
Pittsburgh(h)	2.90c
Philadelphia*	2.90c
San Francisco	3.60c
Seattle	3.60c
St. Louis	3.19c
St. Paul	3.00c
Tulsa	3.25c

IRON BARS	□
Portland	3.40c
Chattanooga	3.31c
Baltimore*	3.00c
Chicago	2.75c
Cincinnati	3.15c
New York‡(d)	3.32c
Philadelphia*	2.90c
St. Louis	3.19c
Tulsa	3.25c

REINFORC. BARS	□
Buffalo	2.60c
Chattanooga	3.31c
Chicago	2.10c-2.60c
Cleveland(c)	1.97½c
Cincinnati	3.25c
Houston	3.25c
Los Ang., cl	2.15c
New Orleans	3.50c
Pitts., plain(h)	3.05c
Pitts., twisted squares (h)	3.175c
San Francisco	2.45c
Seattle	3.50c
St. Louis	3.24c
Tulsa	3.25c
Young.	2.30c-2.60c

SHAPES	□
Baltimore*	3.90c
Boston††	3.17c
Buffalo	3.25c
Chattanooga	3.56c
Chicago	3.20c
Cincinnati	3.40c
Cleveland	3.31c
Detroit	3.40c
Houston	3.00c
Los Angeles	3.70c
New Orleans	3.55c
New York(d)	3.37c
Philadelphia*	2.95c
Pittsburgh(h)	3.15c
Portland	3.55c
San Francisco	3.55c
Seattle	3.55c
St. Louis	3.44c
St. Paul	3.25c
Tulsa	3.50c

PLATES	□
Baltimore*	2.90c
Boston††	3.18c
Buffalo	3.37c
Chattanooga	3.56c
Chicago	3.20c
Cincinnati	3.40c
Cleveland, ¼-in. and over	3.31c
Detroit	3.40c
Detroit, ⅜-in.	3.65c
Houston	3.00c
Los Angeles	3.70c
New Orleans	3.55c
New York(d)	3.40c
Philadelphia*	2.95c
Phila. floor	4.95c
Pittsburgh(h)	3.15c
Portland	3.55c
San Francisco	3.55c
Seattle	3.55c
St. Louis	3.44c
St. Paul	3.25c
Tulsa	3.50c

NO. 10 BLUE	□
Baltimore*	3.05c
Boston††	3.25c
Buffalo	3.62c
Chattanooga	3.36c
Chicago	3.00c
Cincinnati	3.20c
Cleveland	3.11c
Det., 8-10 ga.	3.13½c
Houston	3.35c
Los Angeles	3.80c
New Orleans	3.55c
New York	3.27c
Portland	3.75c
Philadelphia*	3.05c
Pittsburgh(h)	2.95c
San Francisco	3.75c
Seattle	3.75c
St. Louis	3.29c
St. Paul	3.45c
Tulsa	3.70c

NO. 24 BLACK	□
Baltimore*†	3.51c
Boston (g)	3.90c
Buffalo	3.25c
Chattanooga	4.21c
Chicago	3.85c
Cincinnati	4.05c
Cleveland	3.91c
Detroit	3.98½c
Los Angeles	4.45c
New York	3.85c
Philadelphia*†	3.55c
Pitts.** (h)	3.55c
Portland	4.40c
San Francisco	4.40c
Seattle	4.40c
St. Louis	4.09c
St. Paul	3.695c
Tulsa	4.75c

NO. 24 GAL. SHEETS	□
Baltimore*†	4.21c
Buffalo	4.00c
Boston (g)	4.60c
Chattanooga	4.86c
Chicago (h)	4.55c
Cincinnati	4.70c
Cleveland	4.61c
Detroit	4.70c
Houston	4.40c
Los Angeles	5.05c
New Orleans	4.95c
New York	4.50c
Philadelphia*†	4.25c
Pitts.** (h)	4.15-4.45c
Portland	5.00c
San Francisco	5.00c
Seattle	5.00c
St. Louis	4.79c
St. Paul	4.19c
Tulsa	5.10c

BANDS	□
Baltimore*	3.15c
Boston††	3.25c
Buffalo	3.42c
Chattanooga	3.61c
Chicago	3.30c
Cincinnati	3.45c
Cleveland	3.36c
Detroit, ⅜-in. and lighter	3.38½c
Houston	3.25c
Los Angeles	3.90c
New Orleans	3.59c
New York(d)	3.62c
Philadelphia	3.15c
Pittsburgh(h)	3.20c
Portland	3.90c
San Francisco	4.05c
Seattle	3.90c
St. Louis	3.54c
St. Paul	3.20c
Tulsa	3.45c

HOOPS	□
Baltimore	2.30c
Boston	4.25c
Buffalo	3.42c
Chicago	3.30c
Cincinnati	3.45c
Det., No. 14 and lighter	3.38½c
New York	3.62c
Philadelphia	3.40c
Pittsburgh(h)	3.70c
Seattle	5.60c
St. Louis	3.54c
St. Paul	3.75c

COLD FIN. STEEL	□
Baltimore (c)	3.71c
Boston	4.00c-4.50c
Buffalo (h)	3.55c
Chattanooga*	4.06c
Chicago (h)	3.50c
Cincinnati	3.70c
Cleveland (h)	3.50c
Detroit	3.63½c
Los Ang.(f)(d)	4.95c
New Orleans	4.30c
New York	3.92c-4.42c
Philadelphia	3.73c
Pittsburgh(h)	3.45c
Portland (f)	4.75c
San Fran.(f)(d)	5.95c
Seattle (f) (d)	4.75c
St. Louis	3.74c
St. Paul	3.20c
Tulsa	4.65c

COLD ROLL. STRIP	□
Boston, 0.100-in., 500 lb. lots	5.35c
Buffalo	3.39c
Chicago	3.27c
Cincinnati(b)	3.42c
Cleveland (b)	3.20c
Detroit	3.33c
New York	4.70c
St. Louis	3.36c

(b) Plus straightening, cutting and quantity differentials.
(c) Plus mill, size and quantity extras.
(d) Minus quant. diff.
(e) New mill classif.
(f) Rounds only.
(g) 50 bundles or over.
(h) Outside delivery, 10c less.

‡Domestic bars.
*Plus quan. extras.
**Under 25 bundles.
*†50 or more bundles.
†New extras apply.
††Base 40,000 lbs. extras on less.

Prices at Detroit, Cleveland, Chicago, Pittsburgh, Cincinnati, Chattanooga, New York, Boston, St. Louis on heavier lines are subject to new quantity differentials:

399 pounds and less, up 50 cents; 400 to 9999 pounds, base; 10,000 to 19,999 pounds, 15 cents under; 20,000 to 39,999 pounds, 25 cents under; 40,000 pounds and over, 35 cents under base.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Nov. 15

Export Prices f. o. b. Ship at Port of Dispatch—By Cable (or Radio)

PIG IRON	British gross tons U. K. ports £ s d	Continental Channel or North Sea ports, metric tons Quoted in dollars at current value	**Quoted in gold pounds sterling £ s d
Foundry, 2.50-3.00 Silicon	$15.38 3 1 6	$13.21	1 13 0
Basic bessemer	13.75 2 15 0*	12.41	1 11 0
Hematite, Phos. .03-.05	15.50 3 2 0	.....	.....
SEMIFINISHED STEEL			
Billets	$27.50 5 10 0	$18.85	2 7 0
Wire rods, No. 5 gage	39.00 7 16 0	36.08	4 10 0
FINISHED STEEL			
Standard rails	$38.75 7 15 0	$44.10	5 10 0
Merchant bars	1.68c 7 10 0	1.15c to 1.19c	3 2 6 to 3 5 0
Structural shapes	1.65c 7 7 6	1.12c	3 1 6
Plates, †¼ in. or 5 mm.	1.79c 8 0 0	1.50c	4 2 6
Sheets, black, 24 gage or 0.5 mm.	2.07c 9 5 0	2.11c	5 16 0
Sheets, gal., 24 gage, corr.	2.52c 11 5 0	2.36c	6 10 0
Bands and strips	1.91c 8 10 0	1.45c	4 0 0
Plain wire, base	2.07c 9 5 0	1.94c	5 7 6
Galvanized wire, base	2.52c 11 5 0	2.27c to 2.32c	6 5 6 to 6 7 6
Wire nails, base	2.69c 12 0 0	2.09c	5 15 0
Tin plate, box 108 lbs.	$ 4.50 0 18 2	.....	.....

British ferromanganese $85 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d $(43.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

	£ s d		French Francs		Belgian Francs		Reich Marks
Fdy. pig iron, Si. 2.5	$16.88	3 7 6(a)	$13.84	210	$14.45	310	$25.34 63
Basic bessemer pig iron	16.88	3 7 6(a)*	12.19	185	13.28	285	27.95 (b)69.50†
Furnace coke	4.38	0 17 6	7.91	120	5.13	110	7.64 19
Billets	27.50	5 10 0	28.34	430	20.50	440	38.81 96.50
Standard rails	1.85c	8 5 0	2.10c	700	2.31c	1,100	2.40c 132
Merchant bars	1.93c	8 12 0	1.68c	560	1.16c	550	2.00c 110
Structural shapes	1.96c	8 15 0	1.65c	550	1.16c	550	1.96c 107.50
Plates, †¼-in. or 5 mm.	1.89c	8 8 9	2.10c	700	1.47c	700	2.31c 127
Sheets, black	2.35c	10 10 0§	2.55c	850‡	1.63c	775‡	2.62c 144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	2.91c	13 0 0	4.50c	1,500	3.15c	1,500	6.73c 370
Plain wire	2.07c	9 5 0	3.39c	1,130	2.31c	1,100	3.15c 173
Bands and strips	2.09c	9 7 0	1.95c	650	1.47c	700	2.31c 127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continental usually for basic-bessemer steel. a del. Middlesbrough. b Since January.
**Gold pound sterling carries a premium of 64.75 per cent over paper sterling.

Bars

Bar Prices, Page 64

Pittsburgh—Improved alloy steel bar buying has been noted recently, marking the beginning of automotive specifications against coming models. In addition, a fair run of merchant steel bars continues, mainly to miscellaneous buyers. Makers of agricultural implements and small farm tools are also fairly prominent in the bar market, which is some 10 per cent ahead of the same time in October, in specifications and shipments. Prices are based on 1.80c, Pittsburgh, for carbon bars and 2.45c, Pittsburgh base, for alloy bars.

Cleveland—Specifications are improving moderately, with forge shops receiving additional releases from automobile manufacturers, and demand from agricultural implement manufacturers steady. Some of the automobile parts and accessory manufacturers in this district are operating at capacity. Forge shops are protesting against a reported proposal to put 5 x 5-inch rerolling billets on a steel bar price base, whereby they would be required to pay $11 to $14 a ton more for these billets.

Chicago—Small gains in number of bar orders finds little reflection in tonnage since individual purchases are light. Delays still are encountered in release of automotive tonnages and hesitancy in requirements of farm implement makers is attributed to the inventory period. The outlook for better demand from both of these industries is favorable and improved buying is looked for next month.

New York—Orders for commercial steel bars are not only as numerous as a week ago but are somewhat larger on the average.

Philadelphia — While orders are small, there is fair buying of commercial steel bars by manufacturers of spring parts and cold drawn materials and bridge fabricators. The 1.80c, Pittsburgh, or 2.09c, Philadelphia, price is expected to be reaffirmed for first quarter, when producers start filing prices Nov. 20.

Washington—Bids will be opened Nov. 27 by the bureau of supplies and accounts, navy department, on 14 tons of soft steel bars.

Cold Finished

Cold Finished Prices, Page 65

Pittsburgh—Because of sustained cold-finished steel bar buying by miscellaneous manufacturers and some agricultural implement makers, November is fairly certain to record the third consecutive monthly increase in specifications and shipments. No first quarter change appears likely from the present 2.10c, Pittsburgh, base on carbon cold drawn bars or the 2.95c base for alloy quality.

Plates

Plate Prices, Page 64

Philadelphia — The Reading Co. is inquiring for upwards of 800 tons of plates for car repairs, an important development in the local plate market. The Lancaster Iron Works, Lancaster, Pa., will fabricate a steel "knock-down" barge for shipment to Colombia, South America. The plain material requirements are understood to have been placed. Plate tonnage for the 57 electric locomotives recently placed by the Pennsylvania railroad is relatively negligible.

Final tabulation of bids on 4000 tons of steel, principally plates and sheets, for the navy, reveal firm prices throughout. However, no distribution has been made. Bids went in Nov. 16 on 4100 tons of plates, shapes and bars for the navy for destroyer and submarine construction in its own yards. Steel for cruisers to be built in navy yards is yet to be inquired for.

Prices of 1.90c, Coatesville, Pa., or 1.98½c, Philadelphia, are expected to be reaffirmed for first quarter, when producers start filing their prices this week.

Pittsburgh — The market has reverted to dullness pending award of promising river barge work and possibilities of some fair oil tank requirements at several lower Ohio river points. Bids were taken Nov. 14 on a 300-ton elevated tank for Batavia, N. Y. The present 1.80c market on plates, Pittsburgh base, probably will be continued through first quarter of 1935.

Cleveland—Plate orders are restricted to occasional carload lots, mainly from manufacturers of small tanks. The Cleveland plate mill finished a rolling last Wednesday and has no schedule for this week. Some plate sellers believe quantity extras which were named a month ago and then suspended until Dec. 1 will not be rejected entirely, but revised from the original filing. Current base prices are expected to be filed Nov. 20 to become effective Dec. 1 on first quartr business.

Chicago—Plate orders are light, principally for miscellaneous uses. Larger tonnages pending are entirely for government sponsored projects, largely in western states. Little business for railroad use is current or in early prospect.

Boston—Standard Oil Co. tanks at East Providence, R. I., taking 200 tons, features plate demand. Wareham, Mass., has completed plans for a 200,000-gallon water tank. There has been a slight improvement in miscellaneous buying, generally in small lots for early delivery.

New York—With books opening Dec. 1 for first quarter platemakers expect early announcement regarding quantity extras on plates and shapes scheduled to become effective the first of last month and to which fabricators have taken strong exception. A statement may be forthcoming shortly as a result of possible consideration by directors of the American Iron and Steel institute at its meeting Dec. 16. About 450 tons of plates will be required for a 72-inch steel pipe line for the New York water department, bids on which will be opened Nov. 19. Miscellaneous plate demand is sustained.

Birmingham, Ala. — Ingalls Iron Works Co. here has been awarded a contract for six 75-foot barges through war department engineers for use at Jacksonville, Fla. The contract was for $70,534. Alabama Dry Dock & Shipbuilding Co., Mobile, received through the same source a contract for two 60-foot barges for Jacksonville, at $15,694.

San Francisco—Plate bookings during the week were the heaviest in over a month, including 3800 tons of welded steel pipe for the second unit of the Los Angeles aqueduct, placed with the Western Pipe & Steel Co., Los Angeles. Plate mill representatives are interested in the call for bids Nov. 16 for close to 1200 tons of plates and sheets for the Mare Island, Calif., navy yard. An award of 1632 tons of plates and shapes for the Puget Sound, Wash., and Mare Island yards is expected within the next few days.

Contracts Placed

3800 tons, second unit of Los Angeles aqueduct, to Western Pipe & Steel Co., Los Angeles.

300 tons, barge for Colombia, South America, to Lancaster Iron Works, Lancaster, Pa., with plain material reported placed.

120 tons, wind tunnel, Langley field, Virginia, to Chicago Bridge & Iron Works, Chicago.

110 tons, 25,000-barrel tank, Vernon, Calif., to Pacific Coast Steel Corp., San Francisco.

100 tons, 22-inch welded pipe, metropolitan water district, Los Angeles, to Consolidated Steel Corp., Los Angeles.

Unstated tonnage, 250,000-gallon elevated water tank, Shawano, Wis., to

Pittsburgh-Des Moines Steel Co., Pittsburgh.

Contracts Pending

1135 tons, plates and sheets, schedule 3660, Mare Island navy yard, California bids Nov. 16.

800 tons, approximately, Reading Co., Philadelphia, bids asked; material is said to be for car repairs.

558 tons, second unit, aqueduct, Los Angeles; general contracts awarded and metropolitan water district will furnish steel at a later date.

Unstated tonnage, two steel water tanks, 500,000 and 1,000,000-gallon capacity, Stamford, Tex., bids in Nov. 12; also substantial tonnage 12 and 16-inch cast iron pipe.

Unstated tonnage, 200,000 gallon standpipe, Barnstable, Mass., plans complete.

Sheets

Sheet Prices, Page 64

Pittsburgh — Sustained by many small orders for various grades of sheets, including a fair distribution through the common and full finishes, the average of schedules in sheet mills again advanced last week to better than 30 per cent. Continued automotive orders, mainly for December delivery, are encouraging, and buying of heavy hot-rolled sheets, black sheets and galvanized is fairly good. Announcements to be made this week probably will reaffirm the present market on all grades of sheets for the first quarter. A Wheeling district sheet producer last week placed 18 sheet mills in operation, its first schedule in over four months.

Cleveland — The Cleveland sheet mill will increase its operating rate this week from 25 to 35 per cent, having releases on a substantial quantity of automobile sheets, and the sheet mill in an adjacent lake district will continue for the week on full schedule. Ford and Chrysler have issued increased specifications, but those from General Motors units continue light. In no instance, sheet sellers here say, have specifications been issued and then suspended, though demand from the automobile industry is getting under way much slower than expected. The clarification of prices for first quarter, Nov. 20, for bookings Dec. 1, is expected to influence sheet demand.

Chicago — While sheet demand is fairly steady, automotive releases are slow to appear. This is attributed to delays in effecting final designs of new models, but heavier demand is looked for in December. Farm implement manufacturers are expected to provide substantial tonnages over coming months in view of the improved outlook in this industry.

New York — Sheet buying over the past several days has appeared easier. However, such orders as are coming out are of rush character, indicating the low condition of consumers' stocks. The federal post office here, on which James Stewart & Co. are low, and the municipal pier No. 45, North river, on which specifications are expected out shortly, are two outstanding structural projects requiring a substantial tonnage of sheets.

Philadelphia — Prospective autobody work holds principal interest in the sheet market. While there may be some delay, pending the filing of first quarter prices, early action is expected by at least one fabricator. Miscellaneous orders appear more numerous, but they are light and for early shipment. Edward G. Budd Mfg. Co., this city, is low and is reported to have received the contract from the state of New Jersey for automobile license tags to be fabricated next year for 1936 requirements. The state of Pennsylvania is inquiring for a carload of coated steel sheets for road markers. It is understood the material is to be No. 16 gage, 24 x 72 inches.

Buffalo — Production here continues at less than 20 per cent. Reports are heard of larger tonnage being purchased by automobile manufacturers.

Washington — Bids will be taken by the bureau of supplies and accounts, navy department, on 130 tons of black sheets, and 4000 pounds of grade one, corrosion resisting steel sheets.

Cincinnati — Demand for sheets continues close to recent levels, maintaining production slightly above 30 per cent. Automotive specifications have been slow to expand.

St. Louis — Purchasing of sheets by the principal consuming industries continues at a low ebb, the sole exception being the stove and range industry, which has been active later in the season than usual.

Birmingham, Ala. — Sheet mills continue active, and there is not much accumulation. Prices are firm.

Transportation

Track Material Prices, Page 65

Award of 57 electric locomotives by the Pennsylvania, reported last week, is divided as follows: 18 will be built in the Pennsylvania's own shops in Altoona, Pa., where the electrical propulsion and control apparatus for 25 additional engines will also be installed. Baldwin Locomotive Works, Eddystone, Pa., will build the chassis for these latter engines. General Electric Co., will build 14 complete locomotives and the electrical propulsion and control apparatus for nine additional locomotives at Erie, Pa., and the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., the electrical propulsion and control apparatus for 34 locomotives.

These locomotives will each require a cast steel engine frame weighing about 30 tons, a total of 1710 tons. The rolled steel requirements of engines of this type are relatively light compared with steam engines. Few plates will be required, and the tonnage of sheets, light structural members and wheels and axles needed will probably not total more than 12 tons per locomotive, according to trade estimates.

This award is in addition to 28 locomotives ordered in July, and forms part of a program calling for 150 electric locomotives. The current award is one of the largest locomotive equipment orders in the history of American railroading.

The Reading Co. is inquiring for about 800 tons of plates, presumably for car repairs. Award of Norfolk & Western rails gives Carnegie Steel Co., Pittsburgh, 7500 tons and Bethlehem Steel Co., Bethlehem, Pa., 2500 tons. Chesapeake & Ohio is inquiring for 3500 tons of car repair parts.

Lehigh Valley may not purchase from car builders its full list of 250 70-ton hopper cars, on which bids were opened earlier in the month; however, action is expected soon on at least the major portion.

One of the largest export shipments of railroad equipment in considerable time left Philadelphia last week, Baldwin Locomotive Works, Eddystone, Pa., and Bethlehem Steel Export Corp., New York, sending from the Baldwin docks 10 locomotives with tenders and 15 passenger cars for the Chilean State Railways, Chile, South America.

Locomotives Placed

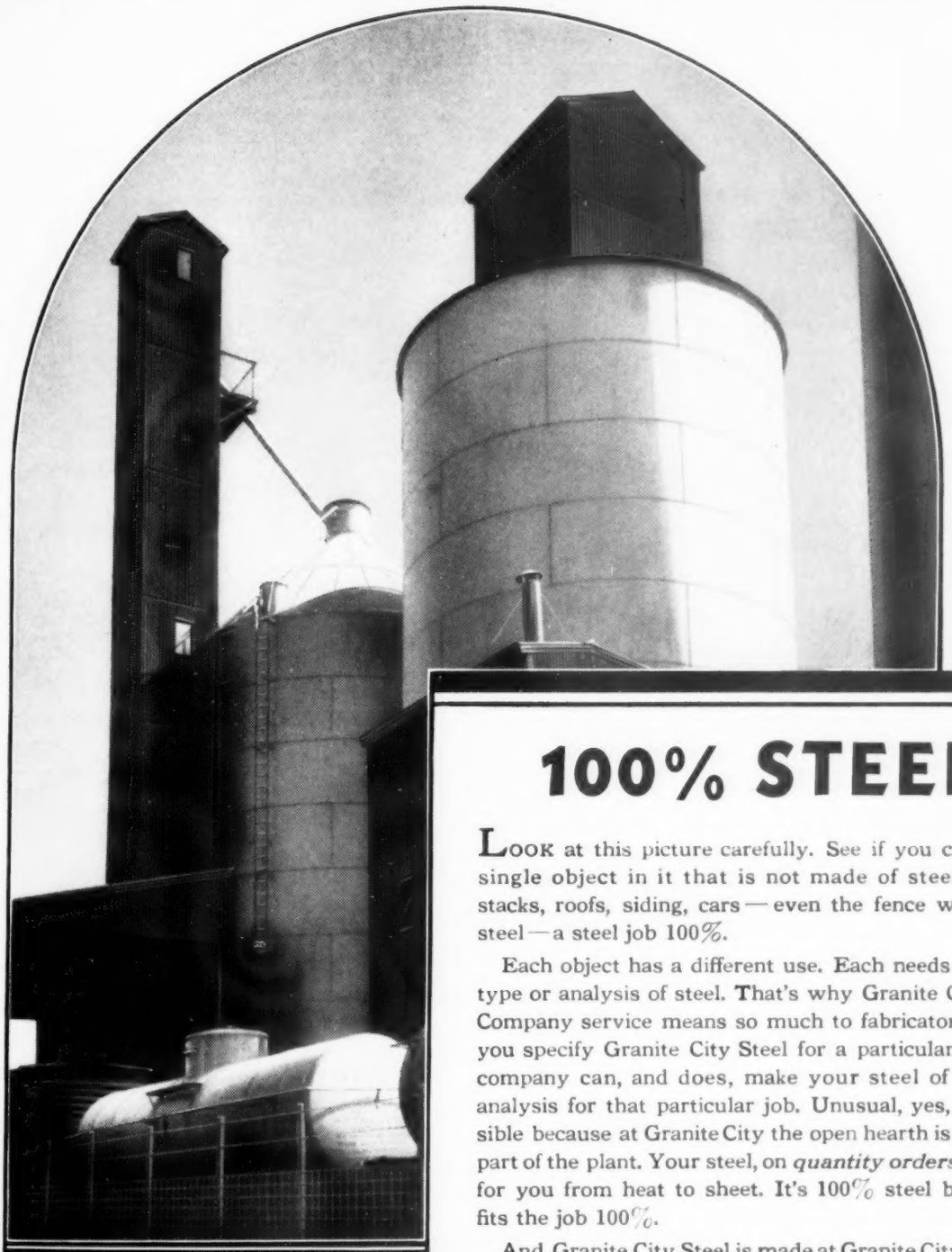
Pennsylvania railroad, 57 electric locomotives, ordered, with work distributed among Baldwin Locomotive Works, Eddystone, Pa., Westinghouse Electric & Mfg. Co., Pittsburgh, General Electric Co., Erie, Pa., and its own shops in Altoona, Pa.

Buses Placed

Lovell Bus Lines Inc., Maynard, Mass., four 32-passenger city buses, to White Motor Co., Cleveland.

Rail Orders Placed

Delaware river bridge commission, Phil-



100% STEEL

LOOK at this picture carefully. See if you can find a single object in it that is not made of steel. Tanks, stacks, roofs, siding, cars — even the fence wire — are steel — a steel job 100%.

Each object has a different use. Each needs a special type or analysis of steel. That's why Granite City Steel Company service means so much to fabricators. When you specify Granite City Steel for a particular job, this company can, and does, make your steel of a proper analysis for that particular job. Unusual, yes, but possible because at Granite City the open hearth is a definite part of the plant. Your steel, on *quantity orders*, is made for you from heat to sheet. It's 100% steel because it fits the job 100%.

And Granite City Steel is made at Granite City, Illinois, only 15 minutes from St. Louis, served by 29 railroads and the Mississippi River — better service to the Mississippi Valley, the West and the Southwest.

GALVANIZED SHEETS
STEEL SHEETS
PLATES AND
TIN PLATE

SINCE
GRANITE CITY STEEL
1878

GRANITE CITY STEEL CO

GRANITE CITY, ILLINOIS
5719 Ellsworth Ave., Dallas
916 Walnut Street, Kansas City
1805 Boatmen's Bank Bldg., St. Louis
1613 Pioneer Building, St. Paul
1502 Mariner Tower, Milwaukee
110 South Dearborn Street, Chicago

adelphia, 600 tons, to Bethlehem Steel Co., Bethlehem, Pa.; tieplates, switches and crossarms to United States Steel Corp. subsidiaries.

Norfolk & Western, 10,000 tons of 131-pound rail, 7500 tons going to Carnegie Steel Co., Pittsburgh, and 2500 tons to Bethlehem Steel Co., Bethlehem, Pa.

Car Orders Pending

Denver Rio Grande Western, four dining cars; inquiry issued.

Locomotives Pending

Chief engineer's office, war department, munitions building, Washington, three to six gasoline-mechanical drive locomotives; bids asked.

Rail Orders Pending

Northern Pacific, 10,000 tons.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 65

The official quotation of 70-10-10-10 off list continues to be observed by most larger producers of bolts and nuts. The 2.90c, Pittsburgh or Cleveland, and 3.00c, Chicago, base is observed on large rivets. Small rivets are firm at 70-5 off. Apparently most larger producers, as well as many buyers, are not availing themselves of certain larger discounts being offered in isolated cases.

The past week there has been little if any interest in bolt, nut and rivet buying at Pittsburgh. Most orders are for small quantities.

Orders from agricultural implement manufacturers and jobbers to Cleveland bolt and nut makers have increased moderately, but little change is noted in demand from automobile interests. Large orders from the latter are not expected until about Dec. 1.

Recent further shading of bolt and nut prices has tended to check the speculative buying at Philadelphia that set in shortly after the announcement of 70-10-10-10 off. Consumers now seem disposed to see how far the market will drop before doing much further buying.

Refractories

Refractories Prices, Page 66

Pittsburgh—Increasing refractory specifications are noted, chiefly for open-hearth rehabilitation. The market on first quality fire clay brick continues $45, local base, with second quality $40. Silica brick is $45 per 1000, and magnesite $65 per net ton. First quarter prices have not yet been determined.

Shapes

Structural Shape Prices, Page 64

New York — It is reported here that an inquiry for 200,000 tons of structural shapes has been issued for a bascule bridge to be erected in Spain. This is one of the largest bridge tonnages in recent years.

For a hurricane gate and navigation lock near Moorehaven, Fla., 2326 tons of shapes and piling have been awarded. Inquiry here is light.

Shipments of fabricated structural steel for October were the largest for any month this year, according to preliminary reports received by the American Institute of Steel Construction, New York. They were 64 per cent larger than the monthly average during the first half of the year. October bookings, however, were approximately 40 per cent below the average for the previous nine months.

Pittsburgh — A 1275-ton school building has been let in Buffalo, and fabricators are entering bids on 3700 tons for the Gallipolis, O., dam. Inquiries recently included nine state highway project for West Virginia to be bid until Nov. 20 at Charleston, W. Va. Plain structural shapes continue 1.80c, Pittsburgh, but fabricated prices are unsteady.

Cleveland—Interest in the market here centers in the award of 3050 tons for the Lorain road bridge over Rocky river, Cuyahoga county (Cleveland), on which general contract bids were submitted late last week. Purchasing of the material is expected shortly to expedite the work. Bids also went in last week on five bridges in Erie county, New York, requiring 400 tons.

Chicago—With a few exceptions structural orders and inquiries are small and are almost exclusively for bridge work. Illinois and Wisconsin take bids this week and next on state bridges requiring nearly 1000 tons, while an Indiana bridge involves 500 tons. Several thousand tons of piling are pending for dams at Muscatine, Iowa, and Winona, Minn.

Boston — Structural steel activity is largely restricted to bridge requirements which are not numerous, but include 600 tons for the Point of Pine bridge, Revere, Mass. The 8500 tons for the Boston parcel post building still pends.

San Francisco—Awards in California are light. Included among the new inquiries is one for 2000 tons for the Hall of Records, Oakland, Calif. Bridge Builders Inc., San Francisco, is low at $835,000 for painting with four coats 121,000 tons of steel in the San Francisco-Oakland bridge.

Shape Awards Compared

	Tons
Week ended Nov. 17	17,651
Week ended Nov. 10	14,118
Week ended Nov. 3	7,250
This week in 1933	28,092
Weekly average, 1933	9,296
Weekly average, 1934	14,540
Weekly average, October	15,673
Total to date, 1933	676,126
Total to date, 1934	769,281

Shape Contracts Placed

2326 tons, shapes and piling, hurricane gate and navigation lock near Moorehaven, Fla. 700 tons of shapes to Virginia Bridge & Iron Co., Roanoke, Va.; 700 tons piling to Carnegie Steel Co., Pittsburgh; 1026 tons piling to Kalman Steel Corp., Bethlehem, Pa.; through E. A. Latham Co., Clewiston, Fla.

1675 tons, scattered state highway bridges, Iowa; 1300 tons to McClintic-Marshall Corp., Bethlehem, Pa., 375 tons to Pittsburgh-Des Moines Steel Co., Des Moines, Iowa.

1400 tons, Columbia highway bridge, Grand Coulee dam, Almira, Wash., to Pacific Car & Foundry Co., Seattle.

1400 tons, highway viaduct, Kansas City, to Kansas City Structural Steel Co., Kansas City, Mo.

1325 tons, three Oklahoma state highway bridges; 1200 tons to J. B. Klein Iron & Foundry Co., 125 tons to Capitol Steel & Iron Co., Oklahoma City, Okla.

1275 tons, Kensington high school, Buffalo, to Buffalo Structural Steel Co., Buffalo.

685 tons, school, Lawrence, N. Y., to Bethlehem Fabricators Inc., Bethlehem, Pa.; through Pasty & Fuhrman Inc.

680 tons, scattered state highway bridges, Missouri; 340 tons, to McClintic-Marshall Corp., Bethlehem, Pa., and 340 tons to St. Louis Structural Steel Co., St. Louis.

650 tons, dam facing, Colorado Springs, Colo., to American Bridge Co., Pittsburgh.

620 tons, scattered state highway bridges, Nebraska; 320 tons to St. Joseph Structural Steel Co., St. Joseph, Mo., and 300 tons to Omaha Steel Works, Omaha, Nebr.

575 tons, tunnel inlets, Wheeler dam, Tennessee valley authority, to Virginia Bridge & Iron Co., Roanoke, Va.

470 tons, bridges, PWA 76-3B-1A, Bates county, Missouri, to Missouri Valley Bridge & Iron Co., Leavenworth, Kans.

350 tons, bridges for Lehigh Valley railroad at Picton and South Plainfield, N. J., to American Bridge Co., Pittsburgh.

340 tons, alterations to two municipal incinerators, New York, to American Bridge Co., Pittsburgh.

320 tons, crane rails, Boulder dam, Nevada, to Stupp Bros. Bridge & Iron Works, St. Louis.

300 tons, bridge repairs, Northern avenue, Boston, to Lehigh Structural Steel Co., Allentown, Pa., A. E. Gaddis, general contractor. Previously

reported as tentatively awarded to same fabricator.

300 tons, bridge, Augusta, Wis., to McClintic-Marshall Corp., Bethlehem, Pa.

300 tons, high school and auditorium, Sherwood, Wis., to unstated interest.

260 tons, state highway bridge, Lane, Nebr., to Omaha Steel Works, Omaha, Nebr.

250 tons, school, Chicago, to Wendnagel & Co., Chicago.

225 tons, state highway bridge, Belle Plaine, Minn., to American Bridge Co., Pittsburgh.

220 tons, highway bridge, Thompson Falls, Mont., for United States department of agriculture, to Virginia Bridge & Iron Co., Roanoke, Va.

210 tons, bridge No. 5395, Cass county, Minnesota, to Minneapolis-Moline Power Implement Co., Minneapolis.

200 tons, Hamilton avenue viaduct, St. Louis, to Mississippi Valley Structural Steel Co., Decatur, Ill.

170 tons, second unit, Los Angeles aqueduct, Calif., to Western Pipe & Steel Co., Los Angeles.

150 tons, bridge, DeSoto, Wis., to Fort Pitt Bridge Works, Pittsburgh.

150 tons, bridge, Danville, Wis., to Worden-Allen Co., Milwaukee.

140 tons, state highway bridge, Smithtown, N. Y., to McClintic-Marshall Corp., Bethlehem, Pa.

140 tons, viaduct floor framing, West 165th street, New York, to McClintic-Marshall Corp., Bethlehem, Pa.

140 tons, bridge, Crawford City, Wis., to Fort Pitt Bridge Works, Pittsburgh.

140 tons, bridge, Smithtown, N. Y., to McClintic-Marshall Corp., Bethlehem, Pa.

130 tons, wind tunnel, Langley Field, Virginia, to Chicago Bridge & Iron Works, Chicago.

120 tons, bridge No. 5269, Minnesota, to American Bridge Co., Pittsburgh.

110 tons, bridge, Livingston county, Missouri, to St. Louis Structural Steel Co., East St. Louis, Ill.

105 tons, bridge, Waltham, Mass., to New England Structural Co., Everett, Mass.

100 tons, ore storage building, Phoenix, N. J., to Belmont Iron Works, Philadelphia.

Shape Contracts Pending

20,000 tons, piling, and 1000 tons fabricated corners for Grand Coulee dam, Almira, Wash.; bids in Nov. 16 to bureau of reclamation, Denver.

2600 tons, contract No. 5, Golden Gate bridge, San Francisco, pending.

2000 tons, Hall of Records, Oakland, Calif.; bids Dec. 12.

1250 tons, parcel post building, Richmond, Va.; readvertised.

1060 to 1600 tons, tunnel ribs, Los Angeles; bids opened.

1055 tons, second unit of Los Angeles aqueduct; general contracts awarded and metropolitan water district will buy the steel later.

940 tons, state highway bridge, Revere, Mass.

650 tons, police headquarters, Buffalo; Charles Everett, Buffalo, low for general contract.

650 tons, state bridge, New York.

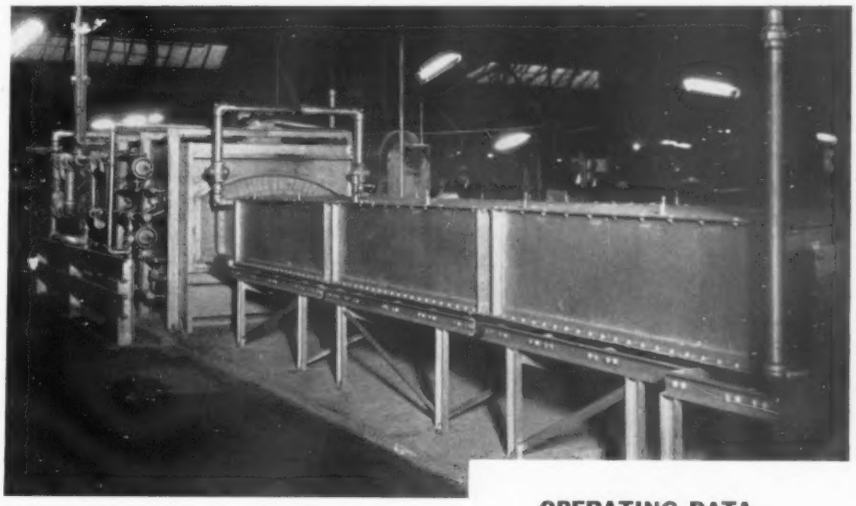
600 tons, filtration plant, Springfield, Ill.

535 tons, Wisconsin state bridge. Bids at Madison, Nov. 20 on 75 tons for Alma, 45 tons for Monroe; Nov. 27 on 265 tons for Alma, 150 tons for Clintonville.

520 tons, 69 towers, department of agriculture, Washington, Aerometer Co.,

HOW EF BRICK HELPS CUT *production costs*

IN THIS (SC) CONTROLLED ATMOSPHERE FURNACE



SC Controlled Atmosphere Furnace for clean-annealing pressed steel automobile wheels. Cooling chamber is shown in foreground.

IMPORTANT are the economies effected by the SC Controlled Atmosphere Furnace shown above —in the elimination of pickling, in the reduction of labor and handling, in preventing heating of excess material.

And vitally important, too, are the other savings and advantages offered by this furnace for which Armstrong's EF Brick is in no small part responsible . . . such things as lower fuel cost, more uniform production, improved quality.

For EF Brick requires no fire brick protection. This semi-refractory brick makes possible thinner walls, quicker heating with less fuel consumption . . . and a consequent sharper furnace. Constant temperatures can be more easily maintained with furnaces built of EF Brick, too, insuring uniform quality production.

OPERATING DATA

on the (SC) furnace shown above*

Total gas required (for heating work and preparing atmosphere) per net pound of work treated, is equivalent to 1.2 cu. ft. of city gas; .645 cu. ft. of natural gas; .208 cu. ft. of Butane gas.

Total cost per net pound of work for heating and atmosphere gas, $0.00077.

Production: 2160 lbs. of work or 650 stampings per hour.

**Quoted from publication of Surface Combustion Corp., Toledo, Ohio.*

You'll find it will pay you to investigate Armstrong's EF Brick carefully. For data and samples write Armstrong Cork & Insulation Company, Insulation Division, 985 Concord Street, Lancaster, Penna.

Armstrong's

HIGH TEMPERATURE PRODUCTS

Armstrong's*, EF, *and Nonpareil Insulating Brick

Chicago, low.

500 tons, state bridge, Hartsdale Junction, Ind.; bids Nov. 20.

450 tons, four sound stages, Warner Bros., Los Angeles; bids soon.

430 tons, Illinois state bridges. Bids at Springfield Nov. 16 on 165 tons for Golden; Nov. 23 on 90 tons for Edwards county, 175 tons for Madison.

350 to 400 tons, five highway bridges, Erie county, New York; bids in Nov. 16.

290 tons, bridge for Chesapeake & Ohio railroad, Cleveland, in Newport News, Va.; bids in.

225 tons, bridge, Belton, Tex.

200 tons, transfer bridge, New York, for Pennsylvania railroad.

140 tons, I-beams and angles, Mare Island navy yard, California, schedule 3661; bids in Nov. 16.

125 tons, one 100-ton and one 25-ton traveling crane, specification 1530, Los Angeles; Harnischfeger Sales Corp., Los Angeles, low.

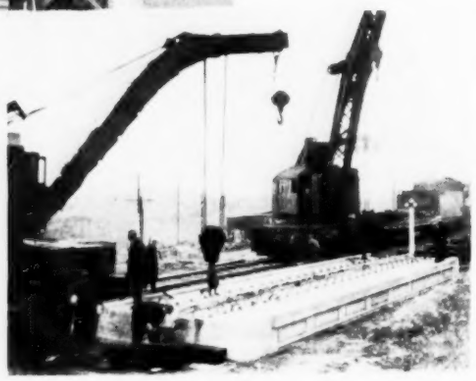
100 tons, prison, Oahu, T. H.; bids in Nov. 14.

Unstated tonnage, four bridge spans for intake towers, Boulder dam, Boulder City, Nev.; bids Nov. 19.

Below: 160 and 100 ton capacity cranes ready to lift concrete slab.

Left: Concrete slab being placed in position.

ACCURACY AND DEPENDABILITY COUNTED ON THIS JOB . . .



The Canadian National Railways, like practically all railroads, use Industrial Brownhoists. Recently, two of their cranes were used in erecting a pre-cast concrete bridge—a difficult job, but one which saved a prolonged diversion of traffic . . . and a lot of money.

The engineers of this road, commenting on their Industrial Brownhoists say: "This particular work involved the lifting at the casting yard, traveling several hundred yards with the load and placing two concrete slabs, each weighing 79 tons and 58 feet 10 inches long. These two slabs were lifted individually, accurately placed in position and fitted alongside each other without damage or hitch".

Few executives realize the savings which a good locomotive or crawler crane will effect on their work. But most Industrial Brownhoist owners admit freely that they could not get along without them. May we tell you why?

INDUSTRIAL BROWNHOIST CORPORATION
General Offices: **Bay City, Michigan**
District Offices: **New York, Philadelphia, Cleveland, Chicago**

INDUSTRIAL BROWNHOIST

Reinforcing

Reinforcing Bar Prices, Page 65

Pittsburgh — The 2.05c, Pittsburgh, market for new billet bars in cut lengths is expected to be announced shortly as unchanged for the first quarter. Meanwhile, reinforcing bar orders reflect an active market and new inquiries include nine state road and bridge projects for West Virginia to close Nov. 20. Approximately 900 tons of rail steel reinforcing bars are expected to be awarded by Frederick Snare Corp., for the Tygarts river reservoir, Grafton, W. Va.

Cleveland—General contract bids were submitted last week on several substantial public works projects in this district requiring concrete bars which should be awarded shortly. The only new project of interest is an extension at Cleveland's westerly sewage disposal plant requiring 150 tons, for bids Nov. 23. Little tonnage is involved in private building work.

Chicago—Two Kansas City interests submitted the low bid on work involving 18,000 tons of bars for the Ft. Peck, Mont., dam. This was the second time bids have been taken on this work, original figures having been rejected. Low bidder on the general contract for the Milwaukee filtration plant involving 4000 tons of bars has been announced. Additional work in the Chicago sanitary district, to be spread over the next eight months, is expected to start soon and eventually may require as much as 10,000 tons of bars.

New York—Inquiry for reinforcing highway mesh is slightly heavier, with additional New Jersey requirements. Billet bar demand is light.

Philadelphia—Reinforcing bar activity is again at a low ebb. While there are two or three fair-size jobs in prospect, including notably the government aircraft factory here requiring 500 tons of bars, inquiries are coming out slowly and orders are

Concrete Awards Compared

	Tons
Week ended Nov. 17	1,100
Week ended Nov. 10	1,988
Week ended Nov. 3	1,851
This week in 1933	2,995
Weekly average for 1933	3,232
Weekly average, 1934	4,415
Weekly average, October	3,229
Total to date, 1933	165,272
Total to date, 1934	203,127

light. State work, the principal support of the market here in recent months, is now lagging. Billet steel bars, cut lengths, are steady at 2.05c, Pittsburgh, or 2.34c, Philadelphia.

San Francisco—Although pending reinforcing bar business in the West is heavy, awards during the past week amounted to less than 500 tons. To date this year bookings exceed 94,000 tons, compared with but 61,293 tons for the corresponding period last year.

Reinforcing Steel Awards

284 tons, hurricane gate and navigation lock near Moorehaven, Fla., to Concrete Steel Co., New York; through E. A. Latham Co., Clewiston, Fla.

200 tons, addition to Western & Southern Life Insurance Co. building, Cincinnati, to Pollak Steel Co., Cincinnati; Ferro-Concrete Construction Co., general contractor.

200 tons, mesh, highway, St. Lawrence county, New York, to Truscon Steel Co., Youngstown, O.; through Louis Mayersohn, Albany.

125 tons, highway, South Dennis, N. J., to Joseph T. Ryerson & Sons Inc., New York.

111 tons, state highway work, in Santa Barbara county, California to unnamed interest.

106 tons, state crossing, Kern county California, to unnamed interest.

100 tons, sewage disposal plant, Ambler, Pa., to Kalman Steel Corp., Bethlehem, Pa.

Reinforcing Steel Pending

18,000 tons, Ft. Peck, Mont., dam; Kansas City Bridge Co. and Massman Construction Co., Kansas City, low on general contract.

4000 tons, Milwaukee filtration plant; Powers Thompson Construction Co., Joliet, Ill., low on general contract.

200 tons, Springfield, Ill., filtration plant.

130 tons, bridge, Norfolk, Va., for Chesapeake & Ohio railroad, Cleveland.

104 tons, state bridge, Fremont county, Colorado; bids opened.

100 tons, miscellaneous work for city of Norfolk, Va.

Pipe

Pipe Prices, Page 65

Pittsburgh — Approximately 5300 tons of 6-inch steel pipe has been placed with German interests for the 100-mile line between Philadelphia and Newark, N. J., for the Sun Oil Co. The pipe is understood to have been produced and awaiting shipment. Specifications for oil country goods, as well as for standard pipe, declined slightly last week, although skelp requisitions of several nonintegrated tubemakers indicate that this is temporary.

Cleveland—A moderate improvement is noted in demand for iron and steel pipe from jobbers. Approximately 20 tons of steel pipe, mainly copper-bearing, in various sizes, will be required for the Lorain road bridge over Rocky river, Cuyahoga county (Cleveland) on which general contract bids were submitted to the state highway department last week.

Chicago — Madison, Wis., has placed 350 tons of pipe and closes bids soon on about 150 tons for intake pipe. Chicago is inquiring for 100 tons of 6-inch pipe in addition to 75 tons of offset bends, bringing pending business for this city to 700 tons. While a number of small tonnages for PWA projects have been closed, shipping instructions are lacking. Springfield, Ill., closes bids Nov. 19 on 400 tons of various sizes for a filtration plant.

New York—Cast pipe buying is in small lots, and the market is characterized by a lack of volume inquiry. Bids are in on 1000 tons for White Plains, N. Y.

Philadelphia — Due to improved demand for casing and line pipe from oil companies, more than 1000 tons

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SHEARED PLATES—BILLETS

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FLOOR PLATES
Diamond, Diamondette and Ribbed Patterns . . .

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of skelp have been placed in this district since the first of the month.

San Francisco — Bookings of cast iron pipe on the Pacific coast, continue to lead those for the corresponding period a year ago by several thousand tons. During the past week a number of municipalities have come into the market for pipe but the total tonnage involved is unimportant. With Sinclair and his EPIC plan definitely out of the picture, it is thought municipal buying will show improvement during the remainder of the year.

Cast Pipe Placed

350 tons, sewage disposal system, Madison, Wis., to James B. Clow & Sons, Chicago.

85 tons, 6 and 8-inch, Hilbert, Wis., to James B. Clow & Sons, Chicago.

80 tons, 6-inch, Watertown, Wis., to James B. Clow & Sons, Chicago.

Cast Pipe Pending

3854 feet, 12-inch, Madison, Wis.; bids Nov. 20.

400 tons, various sizes, Springfield, Ill., filtration plant; bids Nov. 19.

200 tons, 6 and 8-inch, water system, Spruce Pine, N. C.; bids in Nov. 15.

190 tons, 6 and 8-inch, water system, Loris, S. C.; bids in Nov. 13. Project also includes 900 feet of 2-inch; 3300 feet of 1¼-inch; and 4700 feet of 1-inch galvanized pipe, and 10,400 pounds of cast iron fittings.

110 tons, 8 and 12-inch, class 150, Huntington Park, Calif.; National Cast Iron Pipe Co., Birmingham, Ala., low.

100 tons, 6-inch, Chicago, also 75 tons of offset bends for 6, 8 and 12-inch pipe; bids Nov. 23.

Unstated tonnage, 3854 feet of 12-inch for water department, Madison, Wis.; bids Nov. 20.

Unstated tonnage, 2221 feet of 8-inch and 1255 feet of 16-inch, town of Milwaukee, Milwaukee county, Wis.; bids rejected second time and project deferred until spring.

Steel Pipe Placed

230 tons, filtration plant, New Brunswick, N. J., to Alco Products Inc., New York.

Strip Steel

Strip Prices, Page 65

Pittsburgh — Balancing of strip mill inventories appears to have been concluded by several important automotive buyers and last week there was more indication of tonnage purchases. This type of buying, the first of a forward character in some months, promises to continue. No change has occurred in base prices, which continue 1.85c, Pittsburgh, for hot-rolled strip and 2.60c, Pittsburgh or Cleveland, as the cold-rolled base.

Cleveland—Strip mill operations here, like those of the sheet mills, are scheduled for a 10-point rise to 35 per cent this week, due to better specifications from some automobile manufacturers. Orders generally from this industry during the week, however, were light. Miscellaneous users occasionally place 5 to 50-ton lots.

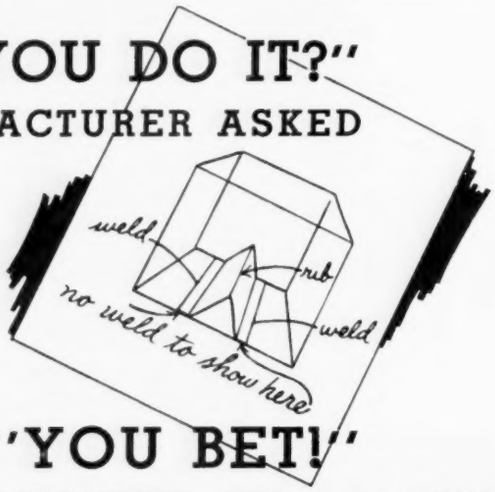
Chicago — Strip demand still is marked by the slowness with which automotive releases are being received, and changes in total business are slight. Miscellaneous users show little change in volume of specifications.

Boston—Incoming cold strip volume continues to fluctuate from day to day, but in the aggregate shows slight gains. One southern New England mill is increasing both hot and cold operations materially. Most mills, however, lack accumulated orders of a size or finish for satisfactory operations.

Washington—Bids will be opened Nov. 20 by the bureau of supplies

FORTY-EIGHT YEARS OF WELDING EXPERIENCE

"CAN YOU DO IT?"
A MANUFACTURER ASKED



"YOU BET!"
ANSWERED THE T.-G. ENGINEER

THEY were discussing a production problem. It involved welding a triangular rib to the inside of a metal tank. Just to make it harder, no evidence of the weld could show on the outside of the tank.

As a result of this conversation a new and ingenious spot welding machine was developed—The Double Arm Series Spot Welder. It makes two welds in series, one on either side of the rib, using the copper surface which supports the work as a short-circuiting block to complete the series and to eliminate depressions on the outside of the tank.

Whether your production problem calls for a special machine like this or the application of standard equipment, Thomson-Gibb welding experts can be of invaluable assistance. Their knowledge and experience is available to you for the asking. The memo below, filled in and attached to your letterhead, will bring you the latest welding facts applying to your product.

THOMSON-GIBB ELECTRIC WELDING CO.

Thomson-Gibb Electric Welding Company
163 Pleasant Street, Lynn, Mass.

Gentlemen:
☐ Please ask your nearest engineer to arrange for an appointment at our plant.
☐ Please MAIL information on the welding o

Product..... Metal .....

Approximate dimensions.....

Desired production per hour.....

614

and accounts, navy department, on 567 tons of black medium flat strip steel.

Philadelphia—Sharp drop in the requirements of manufacturers of heating units and accessories is reflected in strip tonnage here. However, strip mills expect to benefit by increasing needs of auto body manufacturers. Hot strip appears firm at 1.85c, Pittsburgh, or 2.14c, Philadelphia, and cold strip at 2.60c, Pittsburgh, or 2.89c, Philadelphia.

Wire

Wire Prices, Page 65

Pittsburgh—Buyers of wire products continue to enter slightly heavier specifications for both merchant and manufacturing items. The nail market holds steady at $2.60 per keg, Pittsburgh or Cleveland, with manufacturers' wire quoted 2.30c and high carbon spring wire 2.90c. It is expected that these prices will be reaffirmed this week for first quarter.

Cleveland—Demand for manufacturers' wire from miscellaneous sources holds to the recently improved rate, but little impetus comes from the automobile industry. Nut and bolt manufacturers have not yet begun to buy in quantity.

Chicago—Wire demand continues to improve slowly and November business shows a small gain over that of October. Delays in release of automotive orders limit upturn in total business. Wire products continue inactive with little improvement in sight during the balance of the year.

Boston—Improvement in demand for wire is spotty, but tends upward slightly. Drawing operations in several departments are steadier, although mills are far from having enough business for sustained or high operations.

Philadelphia—While recent reductions in some descriptions of wire have caused some hesitancy among buyers of other wire products, pending possible further revisions, buying, on the whole, has been fairly well sustained.

Pig Iron

Pig Iron Prices, Page 66

Pittsburgh — Specifications totaling over 3000 tons of charcoal pig iron have been issued recently by several of the roll manufacturers in this district. These buyers are building up inventories on special grades of charcoal iron in anticipation of possible interruption to future deliveries. Meanwhile, foundry grades at an unchanged market of $18.50, Neville Island, continue to reflect a meager rate of buying, and only one merchant furnace is in blast. Bessemer pig iron is at present unduly depressed but the market holds at $19, Basic iron holds steady at $18, Neville Island.

Cleveland—Pig iron shipments to foundries on automobile work are 25 per cent heavier so far this month than in the corresponding period in October. Stove and range manufacturers continue to take considerable material, though their production normally is downward at this time. Their orders have been well sustained by the government's home modernization program. Various factors combine to hold individual orders to relatively small proportions, few exceeding 300 tons at a time. Not the least important is the

assures

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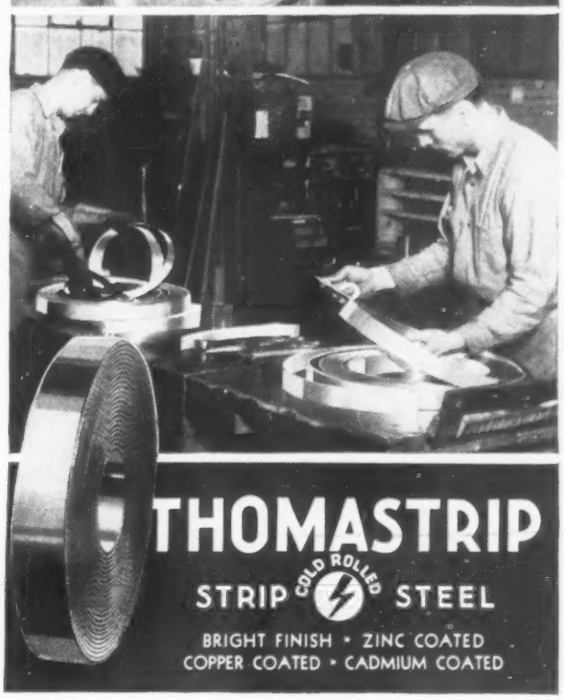
Through every step of production Thomastrip is subjected to rigid inspection and testing. Gauge, width, temper and surface must conform in every respect to the specified requirements of the user . . . Producing cold strip exclusively, Thomas production is specialized. The attention of a centralized organization backed by adequate equipment, is concentrated on the quality production of one product only—Thomastrip . . . That is why so many manufacturers depend exclusively on Thomas for their cold strip requirements.



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WARREN, OHIO
Specialized Producers of
Cold Rolled Strip Steel

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STRIP COLD ROLLED STEEL
BRIGHT FINISH • ZINC COATED
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inability of some foundries to finance purchases. The current base price of $18.50, Cleveland, Toledo, Detroit and Erie, Pa., for No. 2 foundry iron, and base prices on other grades probably will be named Nov. 20, effective Dec. 1, for first quarter.

Chicago — Shipments are well maintained and the outlook is improved by the steady reduction in stocks of some foundries and the interest displayed by certain consumers in first quarter requirements. Inventories at the end of December are expected to be the lowest in several years, a factor which is expected to stimulate first quarter shipments. Foundry operations are well maintained. The market continues $18.50, furnace, for No. 2 foundry and malleable, with no change anticipated on opening of first quarter books Dec. 1.

Boston — Pig iron sales are light, but more interest is being shown for first quarter requirements by some consumers, including one melter who may purchase close to 500 tons of No. 2X and No. 1X. Although generally unchanged, operations have been increased by several melters.

New York — While trading in pig iron for the month so far is better than in the corresponding period of October, buying still is light and some producers report a decline over the past week. New York Central railroad is inquiring for a carload of 8 per cent silvery iron, and the Baltimore & Ohio for a carload of high silicon iron. Filing of prices for first quarter, scheduled Nov. 20, should reveal no change in current quotations.

Philadelphia — Pig iron orders are slightly more numerous, but still light, and in virtually all cases for immediate shipment. No early buying is expected to develop as a result of the recent placing of 57 electric locomotives for the Pennsylvania railroad, each of which will have engine frames of cast steel weighing 30 tons. A large eastern consumer recently has placed a trial order for 400 tons of Russian iron, according to reports here.

Buffalo — Pig iron demand is slow with sales generally of small size and for immediate shipment. Consumers are showing considerable interest in first quarter prices but have no intimation as to what they will be. One of four blast furnaces which have been in production here will be withdrawn from the active list this week after a run of about 60 days. This is a steelworks unit.

Cincinnati — Pig iron buying is limited to carload lots. A slight gain in the melt is noted.

St. Louis—Shipments of pig iron in this area since the first of the month have continued the steady increase started early in September. The movement involves foundry grades almost exclusively, and an even more favorable showing would be made were it not for the extreme quietness in basic iron. Demand for stoves, ranges and heating apparatus continues surprisingly brisk and is extending further into the season than ever before.

Birmingham, Ala. — It is probable that present prices of iron will be maintained through the first three months of 1935. Purchasing at present is in small lots.

Toronto, Ont. — General business in Canadian pig iron markets shows little change from preceding weeks, but sales are running ahead of the volume at the beginning of the year. Awards for the week exceeded 500 tons. Prices are firm and unchanged.

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Famous for Fine Foods
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From the moment you enter our doors you will know that here you are indeed a *guest*. You will appreciate the courteous, cheerful, but *unobtrusive* service for which the Leland is noted. You will revel in the luxury you have a right to expect in a hotel that's as modern as tomorrow's motor car. You will like the superbly convenient downtown location. We hope you will accept our invitation to make the Leland your home in Detroit.

GARAGE IN CONNECTION

(AT CASS AND BAGLEY AVENUES)

DETROIT

Scrap

Scrap Prices, Page 67

Youngstown, O. — Purchases of close to 50,000 tons of steelmaking scrap by an important interest here, with two other melters said to be sounding the market have given the market considerable strength. Dealers are now unwilling to obligate themselves for much more tonnage at the present levels. Up to $11 was paid, it is said, for No. 1 heavy melting steel and 50 cents less for compressed sheets. Strength in the Pittsburgh district has had added effect on the situation here.

Pittsburgh — Consumers' interest in scrap was even more marked last week when a district independent sheet mill paid $11.25 for No. 1 heavy melting steel and another independent followed the same day paying $12 for strict railroad grades. Therefore the market advanced 25 cents a ton to a quotation for local delivery of $11 to $11.50. Machine shop turnings are up to $7.25 to $7.75 and railway specialties have advanced to a range of $14 to $14.50. The appearance of buying interest predicates further price advances locally.

Cleveland—Scrap melters are slow to contract for further supplies and some intimate they will buy little before next year. Foundry scrap is in irregular demand as foundries are operating part time. Valley steelmakers have bought some tonnage recently and prices have gained strength minimum prices being somewhat higher. Dealers are not willing to sell heavily at the present level.

Chicago — Prices offered by dealers and brokers for heavy melting steel justify an advance of 50 cents a ton to $9 to $9.50. Sellers would be unwilling to accept orders at the latter figure and mills show little interest in additional purchases. Prices bid for heavy melting steel on railroad lists generally range above $9.50, delivered.

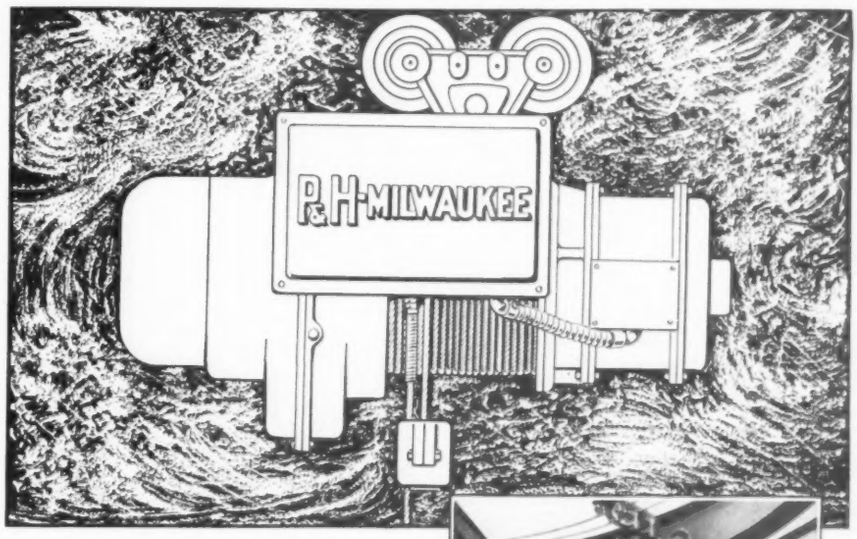
Boston—Export demand for melting steel grades of scrap continues active with nearby supplies lower. Dealers continue to pay $8 to $8.25, dock, for No. 1 and $7.25 for No. 2. These prices are well above what may be paid for delivery in New England and outside domestic points, although for the Pittsburgh district 25 cents a ton higher has been offered for machine turnings without developing business. Shafting is up 50 cents, shipping point.

New York—Buying of steel and iron scrap is confined largely to export. Prices are firm and unchanged. Domestic demand is light, most activity being in melting steel grades.

Philadelphia — A firm undertone continues in scrap, with little outstanding domestic business, but with a good movement in export scrap, making for a scarcity in steel grades. A local foundry which recently was awarded a substantial order for engine frames for the Pennsylvania railroad, will not be in the market soon for scrap and pig iron for this work, it is reliably understood.

Detroit — A strong price situation continues but in the absence of mill buying quotations are unchanged. Lack of consumer purchases is matched by light offerings by motor plants. Increased steelmaking operations are expected to be accompanied by higher prices.

Buffalo — It is reported that purchases of 3000 to 5000 tons of No. 2



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P&H MILWAUKEE ELECTRIC HOISTS
BACKED BY 50 YEARS OF EXPERIENCE

heavy melting steel have been made by one or more local consumers for delivery during the rest of this year. According to reports $8.75 was paid for this material. There is a steady demand for cast at $9.50 to $10.50.

Cincinnati — Quotations on iron and steel scrap are firmer but unchanged. The market trend was stronger on bids taken for recent railroad material. One mill, in recent months out of the market, is buying some open hearth scrap.

St. Louis—Increased firmness is evident in prices of iron and steel scrap, with scanty offerings, diminishing consumer stocks and moderately increased volume of consumer inquiries. A sale of 3000 to 4000 tons of heavy melting steel by an East Side mill was the most important transaction.

Birmingham, Ala. — Scrap consumers show little interest and dealers find light demand. Prices show no change.

Toronto, Ont.—Demand for iron and steel scrap is specialized and spotty. Consumers show little interest and shipments are confined to small lots. Steel grades are moving slowly with limited call for heavy melting steel and turnings from the Hamilton district.

Tin Plate

Tin Plate Prices, Page 64

New York—Prices on stock tin plate will be eliminated beginning Jan. 1, according to indications here. The possibility of consumers being unable to obtain stock material is stimulating buying. No change is expected in the price of production tin plate for first quarter.

Pittsburgh—Announcement of the 1935 contract price on tin plate is expected this week and it is believed the present $5.25, per base box, market will be extended. As tin plate buyers continue to reduce inventories, the present average of operations among tin mills is no better than 35 per cent. An important announcement affecting the sale of stock tin plate is expected to be made officially in the near future.

Warehouse

Warehouse Prices, Page 68

Pittsburgh—Declines in warehouse steel shipments in this district, which set in last week, make it doubtful that the November total will surpass October. Fewer carload orders are noted.

Cleveland—Leading warehouse interests report a shrinkage in number of orders and tonnage. In some instances orders so far this month are only two-thirds those of the comparable period in October. Warehouse interests are doing much cutting, indicating material is being consumed promptly.

Chicago—Sales from store are declining steadily and in keeping with the usual seasonal trend are expected to continue to moderate during the remainder of the year.

Philadelphia—Most jobbers here report a drop in business since the first of the month, particularly in the past week. This trend is largely seasonal, however, with October usually one of the best months of the year. Prices are steady.

Cincinnati — Buying from warehouses fails to produce a definite trend, volume fluctuating within narrow limits. Prices are unchanged.

St. Louis—Iron and steel warehouse interests report little change in volume this month as contrasted with the average in October. Purchasing is largely on a necessity basis, with individual orders small and mainly for prompt delivery.

Iron Ore

Iron Ore Prices, Page 66

Cleveland—Final shipments of iron ore from the Lake Superior district are expected this week. Preliminary estimates by the Lake Superior Iron Ore association indicate the season's total will be 22,175,000 tons, compared with 21,600,000 tons last year.

Receipts at Lake Erie ports for October were 1,761,215 tons, and shipments to interior furnaces, 1,103,091 tons. Respective tonnages in October last year were 3,421,262 tons, and 2,349,415 tons. The association's report on Lake Erie port receipts and shipments to interior furnaces for the season to Nov. 1 follows:

	Receipts	Shipments	Dock Balance Nov. 1 1934
Buffalo	1,566,448	5,467	2,128
Erie	892,867	902,926	121,163
Conneaut	3,194,594	3,171,050	1,884,736
Ashtabula	1,734,249	1,581,621	1,655,735
Fairport	678,722	683,905	387,403
Cleveland	3,898,417	2,569,301	832,505
Lorain	2,026,800	1,132,392	12,527
Huron	391,211	354,982	374,369
Toledo	760,546	395,955	14,250
Total	15,143,854	10,797,599	5,284,816
Comparative 1 year ago	15,380,486	11,445,387	5,335,885

Receipts for the season at other ports:

	Tons
Detroit	632,469
Indiana Harbor	1,250,743
Gary	1,559,900
South Chicago	2,114,986
Sault Ste. Marie, Ont.	120,984
Hamilton, Ont.	394,899
Total	6,073,981
Comparative 1 year ago	4,692,077

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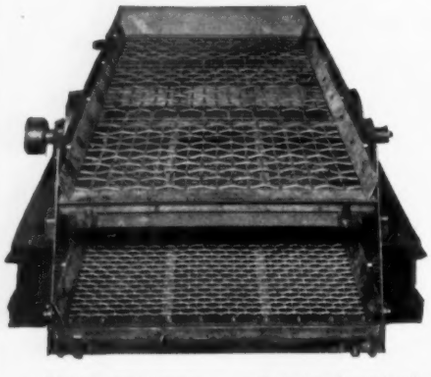

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Nonferrous Metals

Nonferrous Metal Prices, Page 66, 67

New York—Nonferrous metal sales were slow last week. Easiness developed in zinc on Friday in contrast to strength in antimony and commercial bar silver.

Copper—Following light trading during the early part of the week, sales jumped Thursday to 1750 tons for the largest daily total since Labor Day. Favorable developments in the market during the week included the October statistics showing a decline of about 8000 tons in world refined supplies, reports of progress toward an international marketing agreement among world copper producers, and the official announcement showing that practically all copper consumers of importance have signed blue eagle buying agreements.

Lead—Demand slipped to light or moderate carlot business each day. Prices held steady at 3.45c, East St. Louis, and 3.60c, New York.

Zinc—Prime western declined to 3.72½c, East St. Louis, on Friday. Very little competitive interest was shown in the market.

Tin—No improvement in consumer demand developed. Consumers are believed well covered for the balance of the year. Prices were steady and were governed largely by foreign exchange rates.

Aluminum—Metal was still available at 19.00c in a quiet market.

Antimony—Prices moved upward rapidly to the highest level since 1927. The rise was attributed to scarcity of Chinese metal supplies in the domestic market, recent buying for European account, and to a rising trend in the market in China. Closing prices were around 13.25c to 13.50c.

Ferroalloys

Feroalloy Prices, Page 66

Sellers of domestic spiegeleisen are expected to name first quarter prices around Dec. 1. Present indications, however, are that there will be no change, with 19 to 21 per cent at $26, furnace, on quantities up to 50 tons, and $24 on lots of 50 tons and over. Ferromanganese is holding at $85, duty paid, Atlantic and Gulf ports, with the belief prevailing in some quarters that the business outlook for the next period will not warrant an increase; although there appears to be no assurance at the moment that prices will remain unchanged.

The market on wash gravel fluorspar is generally quoted $16, f. o. b. mines, with the delivered price at Pittsburgh $21.25 for all-rail, and around $20 to $20.50 for all-water delivery. However, the fluorspar price at the mines has been shaded to as low as $14 by smaller producers.

Semifinished

Semifinished Prices, Page 65

Several skelp orders ranging from 500 to 1000 tons were placed by nonintegrated tube mills in the past week for immediate shipment, and it is estimated at Pittsburgh these had totaled upward of 5000 tons. At Pittsburgh sheet bar orders have been more numerous. Markets hold at $28, Pittsburgh, for sheet bars, $27 for billets, and $38 for wire rods. Skelp is 1.70c and tube rounds 1.80c.

Metallurgical Coke

Coke Prices, Page 65

Rollmaking foundries in the Pittsburgh district are increasing their metallurgical coke specifications, but other melters continue to buy only small lots of coke and infrequently.

The beehive coke market holds at $3.85 for standard furnace grades, $4.60 for common foundry brands and from $5.10 to $5.35 for premium foundry coke, all on a Connellsville, Pa., oven, basis. Few users are availing themselves of the 25-cent per ton discount on furnace coke contracts.

Shipments of by-product coke at Chicago are about the same as in October with prices unchanged. At Cincinnati by-product coke shipments show an increasing tendency but demand for beehive is dull.

Steel in Europe

Foreign Steel Prices, Page 68

London—(*By Radio*)—Definite upturn in iron and steel production and the foreign trade of Great Britain is shown by statistics for October. Steel ingot output increased 77,300 tons, from 734,700 tons in September to 812,000 tons in October. Pig iron gained 26,800 tons, from 500,300 tons in September to

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527,100 tons in October. The number of active stacks, however, was reduced by one to 97 in October.

Exports of iron and steel products increased from 198,011 tons in September to 220,927 tons in October, and imports advanced from 89,525 tons in September to 120,197 tons in October.

Markets show a general expansion, with pig iron sales increasing at a rate that will require additional production soon. Export prices are hardening, and Germany and Italy are buying some British products. Steel trade is active and foreign inquiry is increasing. Markets in the Midlands are least affected. Tin plate exports show continued growth, but galvanized sheets are dull.

The Continent reports export markets are fairly active. Belgian makers have booked an order for steel sheets for delivery to a Russian consumer.

Quicksilver

New York — Quicksilver is dull here, but prices are nominally unchanged on small lots at $74.50, a virgin flask of 76 pounds, with round lots easy and quotably $73 a flask.

Fabricators Pick Committee To Deal with Institute

A committee to negotiate with the American Iron and Steel institute on all problems of mutual interest to producers and fabricators has been named by the American Institute of Steel Construction.

Headed by C. G. Conley, Mt. Vernon Bridge Co., Mt. Vernon, O., as chairman, the committee includes Charles N. Fitts, New England Structural Co., Boston; W. M. Wood, Mississippi Valley Structural Steel Co., Decatur, Ill.; J. L. Kimbrough, Indiana Bridge Co., Muncie, Ind.; and C. Edwin Michael, Virginia Bridge & Iron Co., Roanoke, Va.

One of the first problems to be taken up by the new committee, it is believed, will have to do with fabrication-in-transit and related questions covered in regulations No. 9 of the American Iron and Steel institute, effective Oct. 10.

Decision to create this committee was made at the annual meeting of the Institute of Steel Construction in Chicago last month.

See Gains for European Industry

(*Concluded from Page* 25)

in the corresponding period of 1933, a reduction of 8 per cent.

While France appears to have balanced her budget for next year, considerable financing must be effected at the beginning of the winter; and this can be done only by borrowing from the public. Owing to continued political unrest and to rumors concerning the possibility of the franc coming off the gold standard, there is general lack of confidence, which is not favorable to an upturn in business.

Committees of various national comptoirs are to meet shortly to review the position. Below the surface, these organizations have been working none too smoothly, and certain modifications are to be expected. Difficulties are also expected with regard to the European steel cartel and the international selling syndicates, owing to the coming plebiscite in the Saar next January. If the Saar returns to Germany, the equilibrium of these international organizations is bound to be disrupted, with lengthy and difficult negotiations.

The tone of the Belgian and Luxemburg heavy industries has somewhat improved. Steel production in Belgium shows an increase of about 12 per cent over that of last year, and Luxemburg production is just under last year's figures for the period January to July.

In Italy and Poland, conditions in the iron and steel trades are fairly good, considering the difficulties of the moment. In Poland, particularly, an improvement has been noticeable since the beginning of the year, in both domestic and export trade. Central European countries have contracted for some interesting business with Russia and Japan. There has been a moderate improvement in Swedish iron and steel trade.

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Equipment

Chicago—Interest in the machine tool market is centered on inquiries for a large number of tools for use by federal arsenals. Bids open at Washington Dec. 3 and 4 on a large portion of this equipment. One list includes 100 milling machines, others involving drills and sheet metal working machines. The Rock Island, Ill., arsenal will receive a large number of these tools. Inquiries from industrial users are fairly active but there is little disposition to make purchases until early next year. Railroads are issuing only an occasional inquiry for machinery and other shop equipment.

Pittsburgh—In spite of the fact that steel mill equipment shops have large order backlogs, no new projects of any size are in prospect. On the other hand, equipment estimators are kept occupied by numerous new installations still in the projective stage. Following award of the Carnegie Steel Co.'s 42-inch new strip mill for Youngstown, O., works, it

is now reported that estimating work will be diverted to Carnegie's Homestead, Clairton and Edgar Thomson works on rehabilitation and enlargement plans. Roll makers, of which three here are prominent in this respect, are more heavily engaged. Inquiry from Great Lakes Steel Corp., Detroit, for a continuous wide sheet mill apparently has been dropped temporarily, but there is some report of inquiry being revived on several Russian rolling mill installations which were first out for figures in America over a year ago.

Washington—Application is about to be made to Secretary Ickes by the army air corps for some $3,000,000 of PWA funds to be used for much needed machinery for maintenance of army air fields. Should the request be granted the money will be used for machine tools of the type used for airplane maintenance and also for tractors, trucks, and grading equipment. It is reported also that the navy department will soon renew its request, once turned down by Secretary Ickes, for PWA funds amounting to some $2,000,000 for diesel engines to be used in repowering naval oil tankers.

Construction and Enterprise

New England

FITCHBURG, MASS.—U-Roll Corp. has been organized to manufacture machinery, by Laurence G. Hobbs, Fitchburg, Mass., and associates.

WEST SPRINGFIELD, MASS.—Sinclair Refining Co., 671 Memorial avenue, is making plans for a 2-story brick terminal plant, 25 x 30, 15 x 30 and 25 x 100 feet, including warehouse, pump house and steel tanks. Cost estimated at about $35,000.

WORCESTER, MASS.—Crompton & Knowles Loom Works, 93 Grand street, is having plans prepared by F. J. Gill, East Main street, Westboro, Mass. for alterations and improvements at its plant, to cost about $28,500.

New York

BUFFALO—New York Central railroad, New York, plans to install motors, conveyors, loaders and material handling equipment at its proposed car unloading and distributing terminal and trestle on Hamburg turnpike, to cost over $1,000,000. (Noted Oct. 29).

LACKAWANNA, N. Y.—Lackawanna Electric Corp. has been incorporated to deal in electrical machinery, by Mary E. McGuire, William Bayjorek and Alfred Stalter, all of Buffalo.

MIDDLETOWN, N. Y.—Orange County Brewing Co., 133 Lake street, will rebuild burned portion of its plant at cost of about $40,000 for building and equipment.

NEW YORK—Forman Machine & Electric Corp. has been organized by Irving Forman, 330 West Thirty-eighth street, and associates, to manufacture mechanical devices and electrical equipment.

New Jersey

JERSEY CITY, N. J.—Kingston-Conley Electric Co., 66 York street, has been established to engage in the manufacture of fractional-horsepower heavy-duty motors. F. S. Kingston is president.

JERSEY CITY, N. J.—Z-Flex Piston Ring Corp. has been organized with $750,000 capital to manufacture piston rings and other automotive equipment, by William R. Meagher, care United States Corporation Co., 16 Exchange place.

TRENTON, N. J.—Stoner & Formica Inc. has been formed with $50,000 capital to engage in metal work. Agent, Estella H. Stoner.

Pennsylvania

NEMACOLIN, PA.—Buckeye Coal Co., Youngstown, O., will build a chute extension to its present river tipple on the left bank of the Monongahela river near here.

NEW EAGLE, PA.—LeMoyne Alloys Co. has taken over the plant of the Le Moyne Steel Co. which it will recondition. The new company will produce tungsten and molybdenum alloys and chemical compounds under patents it owns and will serve the steel trade.

OIL CITY, PA.—Pennsylvania-Conley Tank Car Co., Koppers building, Pittsburgh, has purchased assets and equipment of Oil City Tank Car Co., which will be continued in operation as a branch.

PITTSBURGH—Parts & Equipment Co. has been granted a state charter to manufacture and deal in machinery and motor trucks, by P. W. Mathews, J. M. Cummings and H. W. Claypool, Diamond building, Pittsburgh.

Ohio

CINCINNATI — Kroger Grocery & Baking Co., 35 East Seventh street, has plans by Tietig & Lee, 34 West Sixth street, for a 1-story powerhouse on State street, to cost $150,000. Fosdick & Hilmer, Union Trust building, are engineers.

DAYTON, O.—Inland Mfg. Co., W. S. Whittaker, president, has taken over the land and buildings of the Standard Foundry Co. adjoining its property. These facilities will be used for expansion as future conditions warrant.

DOVER, O.—City plans construction of a new electric generating station in connection with the municipal electric light and power plant, a fund of $330,000 being arranged through federal aid.

LEBANON, O.—Production Plating Works Inc., W. L. Enghauser president, will build a plant addition 36 x 60 feet.

TOLEDO, O.—E. I. du Pont de Nemours & Co., Wilmington, Del., will install motors, conveyors and other mechanical equipment in extensions and improvements to the former plant of the Mountain Varnish & Color Works at Toledo, recently bought at receiver's sale, which will be operated as a branch plant. Cost of alterations and equipment is estimated at $250,000.

WILLOUGHBY, O.—Victor H. Browning & Co. Inc., 17709 Lake Shore boulevard, Cleveland, has acquired the Hadfield Penfield steel plant here, idle since 1925. The Browning company is planning to move some equipment to Willoughby to make ready for work on several contracts calling for cranes at the Boulder dam project.

Michigan

DETROIT—Monopower Corp., 4475 Penobscot building, has been incorporated to deal in power equipment, by Wallace & Co., Penobscot building.

DETROIT—Lau Tool & Gauge Co., 1207 Wayburn, has been formed with $25,000 capital by Charles F. Lau, to manufacture tools.

DETROIT—Bucyrus Products Corp.,

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Transportation building, has been formed to engage in brewery business, by Otto W. Beltz, 1881 Sheldon, Bucyrus, O.

DETROIT—George Auch Co., 3646 Mt. Elliott, has been awarded contract for erection of factory addition on Donald street, Detroit, for F. L. Jacobs & Co., 6901 East Lafayette street.

EAST TAWAS, MICH.—Village is planning to construct a sewage plant and sewers at an estimated cost of $30,000. Burridge & Dillman, Lansing, Mich., engineers.

FLINT, MICH.—George Bachman, Flint, architect, is preparing preliminary plans for two additions, as well as alterations to a Flint building for conversion into a distillery.

GRAND RAPIDS, MICH.—City and Kent county FERA commission will erect a $58,000 head house for a filtering plant. Plans are being prepared by the city engineering department.

GREENVILLE, MICH.—City plans construction of alterations at the municipal electric light and power plant, to cost $30,000 or more. Francis Engineering Co., Saginaw, Mich., is engineer.

HANCOCK, MICH.—Park Brewing Co. will soon begin installation of new equipment and machinery in its plant, including a 100-barrel copper kettle, several vats, an ice machine and cooling system. Initial capacity of the plant will be 60,000 barrels. W. O. Baysinger is president.

MUSKEGON, MICH.—Sale of the Muskegon Brewing Co.'s building, Muskegon, and other assets of the concern to Detroit and Grand Rapids interests was approved recently in Grand Rapids at a hearing before Charles B. Blair, referee in bankruptcy. The new owners plan to spend an additional $40,000 on improvements. A new brew house will be erected.

OWOSSO, MICH.—Preparations are being made for construction on the new sewage disposal plant. It will be started as soon as plans are approved by the Michigan stream control commission.

OWOSSO, MICH.—Renown Stove Co., B. A. Nagelvoort, secretary and treasurer, has announced the opening of a new foundry, increasing by 50 per cent in tonnage its production of castings. The new plant is located in the building formerly occupied by the Advance Castings Co.

PORT HURON, MICH. — Lakeside Brewing Co., recently formed with $275,000 capital, which has taken over the plant formerly occupied by the Port Huron Brewing Co., Bard and Michigan streets, will remodel it and install power equipment, at cost of $90,000. Edward Cole, 2937 Leslie street, Detroit, is head of the company. (Noted Oct. 1.)

QUINCY, MICH. — Branch county FERA commission and village of Quincy plans construction of a $40,000 sewage disposal plant in Quincy.

ST. CLAIR, MICH.—North American Distilleries Inc., Edward A. Loveley president newly organized, plans to build a plant and powerhouse on St. Clair river, to cost over $125,000.

Indiana

HUNTINGTON, IND.—Bids will be taken Nov. 15 by the city council for remodeling of Imhoff tanks, installation of new sludge pumps and other improvements at the sewage disposal plant, to cost about $95,000. C. H. Hurd, 1041 Architects buildings, Indianapolis, is engineer.

LINTON, IND.—Antioch Power Co plans to install electric equipment to develop 6000 kilowatts of power, to cost about $46,000.

VINCENNES, IND.—Steel Products Inc. has been formed to manufacture machinery and steel products, by James M. Barrett Jr., Phil M. McNagny, Mentor Kraus, J. A. Bruggeman and Leigh L. Hunt. E. W. Keepfer, Vincennes, Ind., is named resident agent.

Illinois

CHICAGO—Apex Railway Devices Inc., 21 West Elm street, has been incorporated by Edward T. Doherty to manufacture railroad equipment.

CHICAGO—Kersten Mfg. Co., 2222 Elston avenue, has been incorporated by D. B. Woodworth, H. Lehmann and N. J. Woodworth, to manufacture brass goods, tools, dies, etc. Correspondent: D. B. Woodworth, 2222 Elston avenue.

DECATUR, ILL.—Bids will be received until Nov. 26, O. W. Smith mayor, for construction of a waterworks system to cost about $95,000, a PWA project. Warren & Van Praag, Milliken building, Decatur, are engineers.

District of Columbia

WASHINGTON — Board of district commissioners plans construction of a power plant to cost $1,000,000, with equipment, in connection with a new sewage disposal plant. It will include motor-driven pumping units and auxiliary equipment to cost $100,000. Financing is by federal aid. Total cost of project is $8,000 000. Metcalf & Eddy, Statler building, Boston, are engineers.

WASHINGTON—Bureau of supplies and accounts, navy department, will open bids Nov. 23, schedule 3712 one motor-driven automatic screw machine, delivery Newport, R. I.; Nov. 27, schedule 3711, three electric hoists; schedule 3715, one motor-driven universal milling machine, delivery Puget Sound, Wash.; schedule 3717, one motor-driven cutter and tool universal grinder, delivery Puget Sound, Wash.; Dec. 4 schedule 3729, electric portable pumps, delivery Sewall's Point, Va., and Mare Island, Calif.

Florida

JACKSONVILLE, FLA.—Continental Distilling Corp. of Florida has been incorporated by George G. Smith, 931 Rubel street, and S. M. Pollard.

Kentucky

BRANDENBURG, KY.—City plans waterworks system to cost $44,000. Municipal Engineering Co., 518 Citizens building, Louisville, Ky., engineer.

JEFFERSTOWN, KY.—City plans waterworks system; cost $53,000. Municipal Engineering Co., engineer, 518 Citizens building, Louisville, Ky.

LOUISVILLE, KY.—Home Owners Foundry Co. has been organized by H. B. Jones, Jeff T. Dorsey and L. Leroy Highbaugh.

Louisiana

JACKSON, LA.—Town has been allotted PWA loan of $41,000 for water distribution system, including wells, pumping equipment, and elevated storage tank.

SHREVEPORT, LA.—J. F. Borleand, manager, Jackson Brewing Co., New Orleans, is planning to construct a brewery here, representing an investment of about $1,000 000.

SHREVEPORT, LA.—Sabine Valley Gasoline Co., Ernest Ratcliff and J. D Beaird, Shreveport, plans to erect a compressor gasoline plant with daily capacity of 15,000,000 cubic feet, located south of Sabine river in Gregg county.

Maryland

BALTIMORE—Price Construction Co., Maryland Trust building, has contract for brewery addition for Globe Brewing & Mfg. Co., 3277 South Hanover street. Herbert Aiken, architect, 4115 Ridgewood avenue.

Mississippi

CORINTH, MISS.—Board of managers of Alcorn County Electric Power association has approved plans submitted by Guy W. Thaxton, TVA engineer, for establishment of additional rural power lines to cost about $65,000. Power will be purchased from TVA.

South Carolina

GREENWOOD, S. C. — Greenwood Power Co. has been granted permit to construct and operate hydroelectric power plant on Saluda river at Buzzard's Roost; PWA has granted loan and grant of $2,767,000; plant will furnish power in Greenwood, Laurens and Newberry counties.

Tennessee

DAYTON, TENN.—Tennessee Valley Authority, New Sprankle building, Knoxville, Tenn., plans a 22,000-volt transmission line near Hazel Run shoals in the high-tension power-line between Athens and Dayton.

JACKSON, TENN.—City plans $156,600 waterworks; applied for $150,000 loan and grant. H. E. Dike, City hall, engineer.

KNOXVILLE, TENN.—Cumberland Brewing Corp. has been formed by E. M. Davis and Ben R. Winick.

KNOXVILLE, TENN. — Tennessee Valley Authority, director of purchases, New Sprankle building, Knoxville, will receive bids until Dec. 3 for furnishing and installing two 56,000-kilovolt-ampere vertical-shaft, alternating current generators at the Norris hydroelectric plant and one similar unit of 36,000-kilovolt-amperes capacity at the Wheeler hydroelectric power plant.

MEMPHIS, TENN.—Atlas Clay Co., 1527 Commerce Title building, recently organized by E. M. Ellis and H. N. Smith, to specialize in a new process of purifying petroleum and vegetable oils, may erect a plant.

West Virginia

CRAWLEY W. VA.—Planing mill of L. E. Mankin, on Midland trail, recently sustained damage by fire.

WINFIELD, W. VA.—Kanawha Valley Power Co., W. H. Wheelwright, 1632 Virginia street, Charleston, W. Va., has

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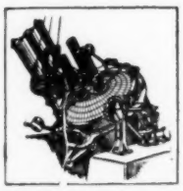

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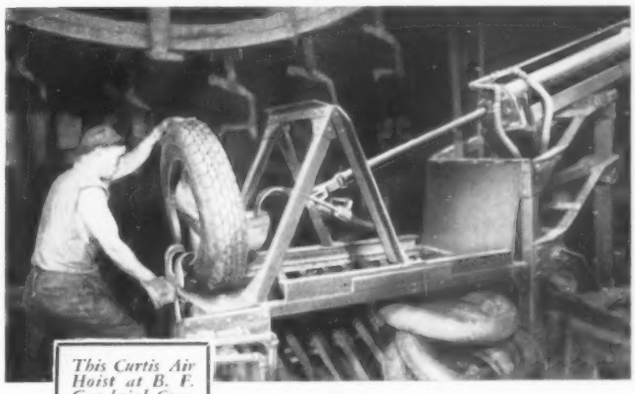

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CURTIS COMPRESSORS — AIR HOISTS — I-BEAM CRANES and TROLLEYS

applied to the federal power commission for license for power project to be located at United States navigation dam No. 1, near Winfield and having an installed capacity of 26,000 horsepower.

Virginia

NEWPORT NEWS, VA.—Grain elevator of the Chesapeake & Ohio recently was damaged by fire.

Missouri

MONETT, MO.—Bids will be taken about Dec. 1 for construction of a sewage disposal plant and equipment, to cost about $50,000. Burns & McDonnell Engineering Co., 107 West Linwood boulevard, Kansas City, Mo., is engineer.

ST. LOUIS—Phoenix Springs Distillery has been incorporated with $25,000 capital by Max M. Weinberg, University City, Mo., and Salie Levin, St. Louis.

Texas

ABERNATHY, TEX.—City, J. D. Norman, mayor, will soon receive bids for waterworks, including 50,000-gallon elevated steel tank on 75-foot tower, booster pumps, meters, etc.; has loan and grant. H. B. Roberts, engineer, Lubbock, Tex.

AVERY, TEX.—City, D. C. Walmsley, engineer, 102 Thomas building, Dallas, Tex., received bids Nov. 27 for well in connection with water works improvements; bids will be open about Dec. 10 for remainder of work, including corrugated iron pump house, 50,000-gallon elevated tank, etc.

DALLAS, TEX.—New Process Roofing & Supply Co., 802 Cadiz street, is planning to erect a warehouse, office and shop building.

HOUSTON, TEX.—Martin Iron Works Inc. has been incorporated by J. R. Martin, J. E. Hargis and T. F. Craine, to engage in manufacturing and construction.

HUGHES SPRINGS, TEX.—City, W. N. McMillan, city secretary, receives bids Nov. 15 for waterworks and sewers; has loan and grant of $82,000. Municipal Engineering Co., Burt building, Dallas, Tex., engineer.

LITTLEFIELD, TEX.—City plans receiving bids soon for waterworks improvements and for erection of 1-story power plant building; loan and grant of $48,000 has been approved by PWA.

McALLEN, TEX.—Rado Refining & Producing Co., Walter K. Campbell, president, is considering installing cracking plant to process crude oil, to cost about $55,000.

MIRANDO CITY, TEX. — Border Foundry & Machine Co. recently sustained damages by fire to its shops, machinery and supply quarters; will rebuild.

MORTON, TEX.—City will soon call for bids for installing waterworks system, including erection of pumping plant; has loan and grant of $23,000. H. B. Roberts, engineer, 2415 Twentieth street, Lubbock, Tex.

OLNEY, TEX.—City, E. Hill, mayor, soon receives bids for waterworks, including 200,000-gallon steel tank and 75-foot tower, pumping unit, etc.; has PWA loan and grant of $135,000. Montgomery & Ward, engineers, Harvey-Snider building, Wichita Falls, Tex.

Wisconsin

GREEN BAY, WIS.—Fort Howard Paper Co. has awarded contracts for construction of a 1-story addition to paper mill, 60 x 120 feet and 53 x 75 feet.

MILWAUKEE—Mid-West Micrometer & Tool Corp. has been incorporated by John Mischker, O. C. Bader and J. R. Hatch.

MILWAUKEE — Goethal-Thompson Sheet Metal Co. has been organized to engage in sheet metal work, by W. Goethal, R. S. Thompson and O. M. Thompson.

MILWAUKEE — Modern Machine Works Inc., 158 North Milwaukee street, general machinist and jobbing shop and maker of power lawn mowers, has opened a branch factory at 2207 Kirkwood avenue, in Cudahy, Wis., a suburb.

MILWAUKEE—Machinery & Welder Corp., a Missouri corporation capitalized at $50,000, has filed articles in Wisconsin. Roy C. Kendall, manufacturers' agent, 2943 North Forty-seventh street, Milwaukee, is authorized representative in Wisconsin.

Minnesota

FAIRFAX, MINN.—City plans construction of an electric light and power plant to cost about $60,000. G. M. Orr & Co., 408 Baker building, Minneapolis, is engineer.

NORTH MANKATO, MINN.—City, E. M. Charles clerk, plans construction of a municipal electric light and power plant, including a powerhouse 45 x 82 feet and distributing system. G. M. Orr & Co., 408 Baker building, Minneapolis, are consulting engineers. Wicks & Stansfield, North Mankato, are engineers.

PRESTON, MINN.—C. P. Grebin, village recorder, will receive bids until Nov. 22 for construction of an addition to the municipal power plant and for furnishing diesel engine generating equipment. G. M. Orr & Co., 408 Baker building, Minneapolis, engineers.

ROCHESTER, MINN.—City will take bids soon for an addition to the municipal electric light and power plant, to cost $100,000 with equipment. Schuett & Meier Co., 490 North Snelling avenue, St. Paul, is engineer. (Noted Nov. 12.)

SPRING VALLEY, MINN.—Reid-Murdoch & Co., 325 North LaSalle street, Chicago, plans construction of a canning factory here.

ST. CLOUD, MINN.—City has defeated an issue of revenue bonds to construct a municipal electric light and power plant estimated to cost $1,294,000. Burns & McDonnell Engineering Co., 107 West Linwood boulevard, Kansas City, Mo., are engineers.

North Dakota

DICKINSON, N. DAK.—Lehigh Briquetting Co., manufacturer of fuel briquets, plans to install power equipment in the new units it is about to build to increase production. Fund of $400,000 is available. W. F. Burnett, 322 Fifth street North, Fargo, N. Dak., is in charge. (Noted Oct. 8.)

South Dakota

CENTRAL CITY, S. DAK.—Black Hills Brewing Co., J. F. Davis, president, will start construction of its brewery late this month, which will have a capacity of 2650 barrels, but will be built with the intention of enlarging it later on. It is planned to produce between 50 and 75 barrels of beer daily.

RAPID CITY, S. DAK.—Dakota Power Co., Sixth and Main street, has been granted a permit for construction of a substation.

Iowa

DAVENPORT, IOWA.—Fleischmann Malting Co. has awarded contract to Priester Construction Co. for alterations to its malting plant.

DAVENPORT, IOWA — Independent Brewing Co. has been incorporated with capital stock of 10,000 shares of common no par value, to modernize and operate the old Independent Brewing Co. plant, which when completed will represent an investment of $750,000 and will have a capacity of more than 1200 barrels of beer daily. The incorporators are Alfred Epstein, M. Iralson, Nathan S Blumberg, Fred Zoller, Carleton S. Smith, Ralph W. Simons, Joseph Harrow and Alfred Magnusson.

Kansas

KINGMAN, KANS. — City council plans extensions and improvements in the municipal electric light and power plant, including diesel engine units and accessories. Cost estimated at $30,000 and bids will be asked soon.

Nebraska

COLUMBUS, NEBR. — Loup river public power district, Harold Kramer, secretary, Columbus, Nebr., will receive bids until Nov. 22 for construction of reservoir and canal earth work on the Columbus-Genoa $7,300,000 canal and power project, the reservoir and canal earth work portion involving 500 tons of reinforcing steel. The whole project includes an 880-foot diversion dam, 35 miles of canals, an electric generating plant and 225 miles of high tension electric lines. Harza Engineering Co., 20 North Wacker drive, Chicago, engineer.

LINCOLN, NEBR. — General Steel Products Co. has been formed by E. O. Erickson and Charles Stuart.

NORFOLK, NEBR.—An election will be held soon on bonds for a municipal electric light and power plant and electrical distributing system. Black & Veatch, Mutual building, Kansas City, Mo., are consulting engineers. (Noted Oct. 22).

Colorado

ASPEN, COLO. — Colorado-Duluth Mining Co., Aspen, Colo., plans construction of a large flotation mill.

BOONE, COLO.—Fund of $40,000 is being arranged for construction of a waterworks system and two miles of mains. J. W. McDonnal, Pueblo, Colo., is engineer. C. Jones Sr. is chairman of the citizens committee.

Pacific Coast

TRACY, CALIF. — City council is obtaining an estimate of cost of substituting diesel power for electric motors to operate pumps of the municipal water plants and generating electricity for street lighting.

HOQUIAM, WASH.—Grays Harbor Pulp & Paper Co. is building a $15,000 addition to its plant to accommodate new equipment.